

ALL TRADES SPECIFICATIONS

WARREN WOODS PUBLIC SCHOOLS
PROJECT NUMBER: 131480
DATE: MAY 17, 2013

PROJECT

WARREN WOODS PUBLIC SCHOOLS

TOWER HIGH SCHOOL

POHI TOILET ROOM RENOVATIONS

OWNER

Warren Woods Public Schools
12900 Frazho Road
Warren, MI 48088

ARCHITECT

Wakely Associates, Inc.
30500 Van Dyke Ave., Suite M-7
Warren, Michigan 48093

SPECIFICATIONS

PROJECT NUMBER 131480
MAY 17, 2013

PROJECT

WARREN WOODS PUBLIC SCHOOLS
TOWER HIGH SCHOOL
POHI TOILET ROOM RENOVATIONS

OWNER

WARREN WOODS PUBLIC SCHOOLS
12900 FRAZHO ROAD
WARREN, MI 48088

ARCHITECT

WAKELY ASSOCIATES, INC.
30500 VAN DYKE, SUITE M-7
WARREN, MICHIGAN 48093
586-573-4100

MECHANICAL

MLS ENGINEERING, INC.
43494 WOODWARD AVENUE - SUITE 207
BLOOMFIELD HILLS, MICHIGAN 48302
248-742-9348

ELECTRICAL

CURRENT DESIGN
1290 BROOK LANE
ROCHESTER HILLS, MI 48306
248-651-3681

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SECTION 00020 - INVITATION FOR BIDS

PROJECT

WARREN WOODS PUBLIC SCHOOLS
TOWER HIGH SCHOOL - POHI TOILET ROOM RENOVATIONS

OWNER

WARREN WOODS PUBLIC SCHOOLS
12900 FRAZHO ROAD
WARREN, MICHIGAN 48088

ARCHITECT

WAKELY ASSOCIATES, INC.
30500 VAN DYKE AVENUE SUITE M-7
WARREN, MICHIGAN 48093
(586) 573-4100

PROJECT DESCRIPTION:

The project consists of renovations in the designated first floor POHI Toilet Rooms of Warren Woods Tower High School, 27900 Bunert Road, Warren, MI 48088. Renovations include new POHI Toilet Room layout, with larger door openings, associated mechanical and electrical renovations, new ceilings, wall and flooring finishes. A mandatory alternate for conversion of a staff toilet room to a new POHI unisex shower room is also being solicited.

TYPE OF PROPOSAL:

A single lump sum proposal is being entertained for the work of this proposal.

DATE OF SUBMISSION:

The Owner will receive sealed proposals for the work herein set forth until 1:30 p.m. EDT, on Friday, May 31, 2013, at Warren Woods Public Schools in the Administration Services Building, 12900 Frazho Road, Warren, MI 48088. Bids will be publicly opened shortly thereafter. Late bids will not be accepted or considered. The bid shall be accompanied by a sworn and notarized statement disclosing any familial relationship that exists between the Owner or any employee of the bidder and any member of the School Board, or the Superintendent of Schools. The Owner will not accept a bid that does not include this sworn and notarized disclosure statement.

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PROPOSAL GUARANTY:

Each proposal must be accompanied by a certified check, cashiers check, or a satisfactory Surety Bid Bond in an amount not less than five percent (5%) of the total bid price as guaranty. No bid shall be considered unless it is accompanied by the required guaranty.

Checks shall be made payable to Warren Woods Public Schools.

Such cash, checks, or bid bonds will be returned to all except the three lowest bidders for each contract within five (5) days after the opening of bids, and the remaining cash, checks, or bid bonds will be returned promptly after the Owner and the accepted bidders have executed the Contract, or if no award has been made, within sixty (60) days after the date of the opening of bids, upon demand of the bidder at any time thereafter, so long as he has not been notified of the acceptance of his bid.

PRE-BID MEETING

A Pre-Bid Meeting will be held at Warren Woods Tower High School, 27900 Bunert Road, Warren, MI 48088 at 3:00 p.m. EDT on Thursday, May 23, 2013.

Attendance at this pre-bid meeting is not mandatory, however, absolutely no extra cost will be allowed for any item or thing which could have been seen by visiting the site.

BIDDING DOCUMENTS:

Bidding documents consist of plans and specifications as prepared by Wakely Associates Inc./Architects, Warren, Michigan.

Bidding documents may be downloaded on or after May 20, 2013 at 3:00 p.m. EDT at the following link:

<http://www.mediafire.com/folder/4bzppajm11ep1>

(Copy and paste this address into your browser)

Copies of the Bidding documents will also be on file for reference at the office of:

1. The Owner
2. CAM, Bloomfield Hills
3. McGraw Hill, Detroit
4. Reed Construction Data, Novi
5. The Architect

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PROPOSAL ACCEPTANCE:

The right to accept and/or reject any and all proposals and to waive any and all informalities and/or irregularities in bid proposals submitted during the bidding process is reserved by the Owner, which right may be exercised at the sole discretion of the Owner.

PROPOSAL WITHDRAWAL:

Proposals for base bids may not be withdrawn for a period of sixty (60) days after the time established for the receipt of proposals. Bidders may withdraw at any item prior to the time set for the receipt of proposals.

END OF SECTION 00020

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SECTION 00100 - INSTRUCTIONS TO BIDDERS

Owner will receive sealed proposals only as set forth in the Invitation to Bid and complying with all requirements as contained in Instructions to Bidders.

DOCUMENTS

Bidding documents consist of plans and specifications as prepared by Wakely Associates Inc./Architects, Warren, Michigan.

Bidding documents may be downloaded on or after May 20, 2013 at 3:00 p.m. EDT at the following link:

<http://www.mediafire.com/folder/4bzppajm11ep1>

(Copy and paste this address into your browser)

Copies of the Bidding documents will also be on file for reference at the office of:

1. The Owner
2. CAM, Bloomfield Hills
3. McGraw Hill, Detroit
4. Reed Construction Data, Novi
5. The Architect

BIDDING DOCUMENTS

The Bidding Documents consist of the following:

The Drawings as enumerated in Section 00851, Index of Drawings.

The Specifications as enumerated in the Table of Contents.

All other documents as provided for in Article 1, Paragraph 1, Section 1 of the General Conditions as modified.

EXAMINATION

Each bidder shall examine the Bidding Documents and satisfy himself about the extent of the proposed work by personal examinations of the site and surroundings, and make his own estimate therefrom of the facilities and difficulties attending the performance and completion of the job.

No additional compensation will be allowed on account of conditions which could be determined by examining the Bidding Documents or the site.

INTERPRETATION

If any person contemplating submitting a bid is in doubt as to the true meaning of any part of the Drawings, Specifications, or other Bidding Documents, he must submit to the Architect a written request for an interpretation thereof. If such an interpretation is not requested, the bids will be presumed to be based upon the interpretation and directions given by the Architect after Contract award, in accordance with provisions of the Contract.

Neither the Owner nor the Architect will be responsible for any verbal explanations or interpretations of the Bidding Documents.

Every request for such interpretation should be in writing, addressed to the Architect at his office, and to be given consideration, must be received at least five (5) days prior to the date fixed for the opening of bids. Any and all such interpretations, and any supplemental instructions will be in the form of written addenda to the Bidding Documents which, if issued, will be mailed to all prospective bidders (at the respective address furnished for such purposes) prior to the date fixed for the opening of bids. All addenda so issued shall become part of the Bidding Documents.

SUBSTITUTIONS

To obtain approval to use unspecified products, bidders shall submit written requests at least five (5) days before the bid date. Requests received after this time will not be considered. Requests shall clearly describe the product for which approval is asked, including all data necessary to demonstrate acceptability. If the product is acceptable, the Architect will approve it in an Addendum issued to all prime bidders on record.

BASIS OF BID

A single lump sum proposal is being entertained for the complete work of this proposal.

Partial or segregated bids or assignments will not be considered. Include quotes for all alternates and unit prices; failure to do so may result in rejection of the proposal.

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PREPARATION

Proposal shall be submitted on the form bound in these specifications, Form of Proposal, in original form without erasures, interlineations or alterations.

Submit two (2) copies of proposal, retain one for your records. Oral, fax, email, or telephone proposals will not be accepted.

Proposals must be filled out in ink or typewritten in duplicate. Blank spaces in the proposals must be filled in and no changes shall be made to the phraseology of the proposal. Quotes shall be entered in verbal and numeric forms. In case of a discrepancy between the written and the numeric form, the written form shall govern.

All bids shall be signed and dated in longhand.

Bids which are not signed by the individual making them should have attached thereto a power of attorney, evidencing authority to act as agent for the person whom it is signed.

Bids which are signed for a partnership should be signed by one of the partners or by an attorney-in-fact. If signed by an attorney-in-fact, evidence of authority to sign the bids shall be attached.

Bids which are signed for a corporation should have the correct corporate name thereon and the signature of the president or other officer legally able to contract in the name of the corporations. In addition, a signed Secretary's Certificate evidencing the authority of the Officer to contract in the name of the corporation shall be included. Any proposal submitted by a corporation shall bear its seal.

BID SECURITY

The successful bidders securities will be retained until they have signed the Contract and furnished the required payment and performance bonds. The Owner reserves the right to retain the security of the next two lowest bidders for each contract until the lowest bidders enter into contract, or until sixty (60) days after the bid opening, whichever is the shorter. All other bid security will be returned as soon as practicable. If any bidder refuses to enter into a Contract, the Owner will retain his Bid Security as liquidated damages, but not as a penalty.

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SUBCONTRACTORS

The Owner and Architect reserve the right to require of bidders tentatively selected for consideration in the awarding of the Contract, a list of the subcontractors whom the Contractor intends to employ.

The Owner reserves the right to disapprove the use of any proposed subcontractor, and in such event, the bidder submitting such subcontractor shall submit another such subcontractor in like manner within the time specified by the Owner. The Owner reserves the right to reject any bid if such information required by the Owner is not submitted as above indicated.

SUBMITTAL

Submit proposals in sealed opaque envelopes having listed thereon the following:

**PROPOSAL: WARREN WOODS TOWER HIGH SCHOOL
POHI TOILET ROOM RENOVATIONS
ATTN: NEIL CASSABON, BUSINESS MANAGER**

Contractor: _____

WITHDRAWAL

Proposals for base bids may not be withdrawn for a period of sixty (60) days after the time established for the receiving of proposals. Bidders may withdraw at any time prior to the time set for the receiving of proposals.

IRREGULARITIES

The Owner reserves the right to disqualify Bids before or after opening, upon evidence of collusion with intent to defraud, or other illegal practices upon the part of the bidder.

The Owner also reserves the right to reject any or all bids in whole or in part and to waive any informalities therein.

Any error and/or omission in the proposal form or any other irregularity as a result of negligent preparation shall not furnish cause for relief for any damages resulting therefrom, nor in any way relieve the Contractor from fulfillment of all contractual obligations as provided for in the Bidding Documents.

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TAXES AND CONTRIBUTIONS

Proposal, unit prices, alternate prices stated include all taxes or contributions required by bidders business.

Michigan State sales tax is applicable to this work.

OPENING

Proposals will be publicly opened and read aloud.

BID BREAKDOWN CONSTRUCTION INFORMATION

Upon notice from the Architect, the low bidders shall submit a detailed cost breakdown of all work covered by the Bidding Documents. The breakdown shall show quantity of material and labor, units of material and labor, material cost, labor cost and total cost.

AWARD OF CONTRACT

The Contract will be awarded to the lowest responsible bids, complying with the terms of the Bidding Documents, with full consideration of alternates.

EXECUTION OF CONTRACT

The Owner reserves the right to accept any and all bids, or to negotiate contract terms with the various bidders when such is deemed by the Owner to be in his best interest.

END OF SECTION 00100

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SECTION 00311 - PROPOSAL FORM/ALL TRADES

Name of Contractor

Address, City, Zip

Phone # / Fax #

Email Address

PROJECT

WARREN WOODS PUBLIC SCHOOLS
WARREN WOODS TOWER HIGH SCHOOL
POHI TOILET ROOM RENOVATIONS

OWNER

WARREN WOODS PUBLIC SCHOOLS
12900 FRAZHO ROAD
WARREN, MICHIGAN 48088

ARCHITECT

WAKELY ASSOCIATES, INC.
30500 VAN DYKE AVENUE SUITE M-7
WARREN, MI 48093

BASE PROPOSAL

Pursuant to and in compliance with the Invitation to Bid and the Instructions to Bidders, and having carefully examined the Bidding Documents and all Addenda, the undersigned agrees to enter into an agreement with the Owner to complete the work in accordance with the said Bidding Documents for the sum of:

(Sum to be written out)

Dollars \$_____

Cost of bond (if bid is less than \$50,000: if bid is \$50,000 or higher, bond cost is to be included in bid)

Dollars \$_____

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ALTERNATES

The undersigned further proposes to execute the work specified in the respective technical division or indicated on the drawings for the sum added to the base proposal as stated below:

ALTERNATE NO. 1: Provide all required labor, materials and facilities required to convert the designated existing staff toilet room to a new POHI unisex shower as indicated on the drawings.

ADD: _____
_____ Dollars \$ _____

ALTERNATE NO. 2: Provide all required labor, materials and facilities required to provide and install custom plastic laminate cabinets per Spec Section 06402 "Interior Architectural Woodwork" in lieu of pre-manufactured plastic laminate casework per Spec Section 12300 "Plastic Laminate Casework".

ADD: _____
_____ Dollars \$ _____

VOLUNTARY ALTERNATES

The following voluntary alternates are offered by the bidder. The undersigned agrees that the amounts indicated below shall be added to or deducted from the Base Bid, as the case may be, for each alternate which is accepted.

<u>Description of</u> <u>Voluntary Alternates</u>	<u>Add</u>	<u>Deduct</u>
1. _____	_____	_____
2. _____	_____	_____
3. _____	_____	_____
4. _____	_____	_____

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PRICE GUARANTEE

The undersigned proposes that the price stated in this Proposal is guaranteed for sixty (60) consecutive days from bid date.

TAXES

The undersigned acknowledges that the price stated above includes all taxes of whatever character or description.

SUPPLEMENTAL FEES

For additional work performed upon instruction of the Owner by subcontractors of the undersigned, add to the subcontractor's prices for such additional work a fee of _____% which includes all the charges of the undersigned for overhead and profit.

Any additional work performed upon instructions of the Owner by persons other than the subcontractors of the undersigned, the charges will be actual cost of all labor and materials (less all discounts) plus the fee of _____% which includes all the charges of the undersigned for overhead and profit and to which shall be added the actual cost of insurance and taxes.

Each proposal covering extra work shall be accompanied with complete itemized material and labor breakdowns.

For all revisions involving the deletion of contract work, it is agreed that full credit shall be given the Owner for such work deleted, including overhead and profit as quoted hereinbefore.

TIME OF COMPLETION

The undersigned agrees to commence work operations immediately upon the last day of school, Monday, June 17, 2013, with substantial completion of the work by Friday, August 16, 2013, and that the proposed bid is in full consideration of this.

ADDENDA

If any addenda or bulletins covering changes to the Bidding Documents have been received during the bidding period, the bidder shall fill in their numbers and dates which acknowledges having received same, and having included in this Proposal the work involved:

_____ Dated _____

_____ Dated _____

_____ Dated _____

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BID SECURITY

A bid bond executed by a U.S. Treasury Listed Surety Company acceptable to Warren Woods Public Schools or a cashier's check in the amount of at least 5% of the sum of the proposal payable to Warren Woods Public Schools shall be submitted with each proposal in excess of \$21,825. All proposals shall be firm for a period of sixty (60) days.

PERFORMANCE AND LABOR BOND

Successful bidders whose proposals are \$50,000 or more will be required to furnish a U.S. Treasury Listed Company Performance and Payment Bond in the amount of 100% of their bid. The cost of the Bond shall be included in each proposal.

Bidders are to indicate cost of bond on the Bid Form if total bid is less than \$50,000. Owner will make a decision if bond is required on all bids less than \$50,000.

The Board of Education reserves the right to reject any and/or all bids in whole or in part and to waive any informality therein. The Board of Education reserves the right to accept that bid which in its opinion, is in the best interest of the Owner.

FAMILIAL DISCLOSURE

Bidder has included Section 00401 Familial Disclosure Form (bid will not be read without this form)

NEGOTIATION

The undersigned agrees that, should the overall cost exceed the funds available, he will be willing to negotiate with the Owner and Architect for the purpose of making further reductions in the Contract work, and shall agree to give full credit for all such reductions in the work requested by the Owner, including full value of labor, materials, and subcontract work and reasonable proportionate reductions in overhead and profit, thereby arriving at an agreed upon Contract price.

WARREN WOODS PUBLIC SCHOOLS
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CONTRACT EXECUTION

The undersigned agrees to execute a Contract for work covered by this Proposal, provided that he be notified of its acceptance within sixty (60) days after the opening of bids.

The undersigned hereby declares that he has the legal status checked below:

() Individual

() Partnership having the following partners:

() Corporation incorporated under the State laws of:

This proposal is submitted in the name of, and notice of acceptance should be mailed, faxed, or delivered to:

Date:

Firm's Name:

Phone No. ()

By:

(Signature)

In the presence of:

Title:

END OF SECTION 00311

WARREN WOODS PUBLIC SCHOOLS
POHI TOILET ROOM RENOVATIONS
TOWER HIGH SCHOOL

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SECTION 00401 - FAMILIAL DISCLOSURE FORM

All bidders must complete the following familial disclosure form in compliance with MCL 380.1267 and attach this information to the bid.

By the attached sworn and notarized statement we are disclosing the following familial relationship(s) that exists between the owner or any employee of the bidder and any member of the board, intermediate school board, or board of directors or the superintendent of the school district, intermediate superintendent of the intermediate school district, or chief executive officer of the public school academy. (Warren Woods Public Schools shall not accept a bid that does not include this sworn and notarized disclosure statement.)

Disclose any familial relationship and complete the form below in its entirety:

The following are familial relationships as described above (provide employee name, family contact name, family contact position, and familial relationship or NONE.)

Signature(s): _____ Title: _____

Name of Firm: _____

STATE OF MICHIGAN)
) SS
COUNTY OF)

On this _____ day of _____, 20____, before me a Notary Public in _____ and for _____ said county, _____ personally appeared _____, agent of the said firm _____, and who acknowledged the same to be his free act and deed as such agent.

Notary Public

END OF SECTION 00401

WARREN WOODS PUBLIC SCHOOLS
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SECTION 00710 - GENERAL CONDITIONS

DOCUMENTS:

"The General Conditions of the Contract for the Construction"
A.I.A. Documents A-201, 2007 Edition, Forms a part of these
Specifications and shall have the same effect as if bound herein.

This Document is modified as described in Modifications of the
General Conditions.

Contractors shall be held responsible for having familiarized
themselves with this Document and all other documents affecting
their contracts in this Specification.

END OF SECTION 00710

WARREN WOODS PUBLIC SCHOOLS
POHI TOILET ROOM RENOVATIONS
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SECTION 00810 - MODIFICATIONS OF THE GENERAL CONDITIONS

The following modify, change, delete from, or add to the "General Conditions of the Contract for Construction" AIA Document A201, 2007 Edition. Where any Article of the General Conditions is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph, or Clause shall remain in effect.

ARTICLE 1, GENERAL PROVISIONS

Add the following Subparagraph to Paragraph 1:

1.2.4 Work not covered in the Contract Documents will not be required, unless it is consistent therewith and is reasonably inferable therefrom as being necessary to produce the intended results. Where reference is made to specifications of manufacturers, trade associations or the like, such is understood to be made a part of this Specification to have the same effect as if fully reproduced herein. Approval or equal, acceptable, and words of similar definition are understood to mean in the judgment of Architect.

Add the following Subparagraph to Paragraph 1:

1.2.5 Computed dimensions take precedence over scaled dimensions, large scale details over smaller; should disagreements occur in the drawings, or the Specifications describe a higher quality of work or material, the better quality shall be estimated, unless otherwise directed by the Architect. The Architect shall be notified at once, in writing, of any and all discrepancies.

ARTICLE 3, CONTRACTOR

Add the following Subparagraph to paragraph 3:

3.4.4 After the Contract has been executed, the Owner and the Architect will consider a formal written request for the substitution of products in place of those specified only under the conditions set forth herein.

3.4.5 By making requests for substitutions based on Clause 3.1.3. above, the Contractor:

- (a) represents that he has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;
- (b) represents that he will provide the same warranty for the substitution that he would for that specified;
- (c) certifies that the cost data presented is complete and includes all related costs under this Contract, but excludes cost under separate contract, and excludes the Architect's redesign costs, and waives all claims for additional costs related to the substitution which subsequently becomes apparent; and
- (d) will coordinate the installation of the accepted substitute, making such changes as may be required for the work to be complete in all respects.

Change Paragraph 3.7, Subparagraph 1, to read as follows:

3.7.1 General Trades Contractor shall secure and Owner pay for general building permit review through the State Agencies (BFS & BCC). General, Mechanical and Electrical Trades Contractors shall secure and pay for all other permits and governmental fees, licenses and inspections as their work may require for the proper execution and completion of the Work which are customarily secured after execution of the Contract and which are legally required at the time the bids are received.

3.7.1.1. Owner will pay for all sewer and water escrow fees, capital charges, assessment fees, and frontage fees.

3.7.1.2. All other fees, permits and tapping charges shall be applied for and obtained by Mechanical Trades Contractor, and shall be paid for by the Owner.

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ARTICLE 5, SUBCONTRACTOR

Add the following Subparagraph to Paragraph 5:

5.2.1.1. No later than (10) days after the award of contract the Contractor shall furnish, in writing to the Owner through the Architect the names of persons or entities proposed or manufacturers for each of the products identified in the General Requirements (Division of the Specifications) and where applicable, the name of the installing subcontractor.

Article 7, CHANGES IN THE WORK

Add the following sentence to paragraph 7.3.7

7.3.7.6 The Contractor shall not incur any cost to be reimbursed as part of the adjustment in the contract sum prior to the commencement of the construction phase.

ARTICLE 8, TIME

8.3.1 Delete reference to arbitration.

ARTICLE 9, PAYMENTS AND COMPLETION

Add the following sentence to Subparagraph 9.3.1.:

The form of Application for Payment shall be a notarized AIA Document G702, Application and Certification for payment, supported by AIA Document G703, Continuation Sheet.

Add the following Clause 9.3.1.3. to 9.3.1:

Until the work is 50% complete, the Owner shall pay 90% of the amount due the Contractor on account of progress payments. At the time the work is 50% complete and thereafter, the Architect may, upon written request and satisfactory progress authorize remaining partial payments to be paid in full.

ARTICLE 11, INSURANCE AND BONDS

Add the following Subparagraph:

11.1.1.9. Liability Insurance shall include all major divisions of coverage on a comprehensive basis including:

- (1) Premised-Operations (including X-C-U)
- (2) Independent Contractors Protective
- (3) Products and Completed Operations
- (4) Personal Injury Liability with Employment Exclusion deleted.

- (5) Contractual-including specified provisions for Contractor's Obligation under Paragraph 3-18
- (6) Owned, non-owned, and hired motor vehicles.
- (7) Broad Form Property Damage, including Complete Operations.

Add the following Subparagraph:

11.1.1.1. If the General Liability coverages are provided by a Commercial General Liability Policy on a claims-made basis, the policy date or Retroactive Date shall predate the Contract; the termination date of the policy or applicable extended reporting period shall be no earlier than the termination date of coverages required to be maintained after final payment, certified in accordance with subparagraph 9.10.2.

Add the following Subparagraph:

11.1.2.1. The Insurance required by Subparagraph 11.1.1. shall be written for not less than any limits of liability specified in the Contract Documents, or required by law, whichever is greater. Provide minimum limits as follows:

- (1) Worker's Compensation:
 - (a) State - statutory
 - (b) Applicable Federal - statutory
 - (c) Employer's Liability - \$100,000
 - (d) Benefits required by Labor Union Contracts.
- (2) Comprehensive General Liability, including Premises-Operations, Independent Contractor's Protective, Products and Completed Operations, and Broad Form Property Damage:
 - (a) General Policy: \$2,000,000 aggregate
 - (b) Bodily Injury:
 - \$1,000,000 Each Occurrence
 - \$1,000,000 Aggregate Products and Completed Operations

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- (c) Property Damage:
 - \$1,000,000 Each Occurrence
 - \$1,000,000 Aggregate

- (d) Product and Completed Operations Insurance shall be maintained for a minimum period of one year after final payment, and Contractor shall continue to provide evidence of such coverage to Owner on an annual basis during the coverage period. Name **Warren Woods Public Schools** as additionally insured primary coverage.

- (e) Property Damage Liability Insurance shall include coverage for X (Explosion), C (Collapse) and U (Underground).

- (f) Contractual Liability (Hold Harmless Coverage):
 - Bodily Injury - \$1,000,000 Each Occurrence
 - Property Damage - \$1,000,000 Each Occurrence
 - \$1,000,000 Aggregate

- (g) Personal Injury with Employment Exclusion deleted:
 - \$1,000,000 Aggregate

- (3) Comprehensive Automotive Liability (Owner, non-owned, hired):
 - (a) Bodily Injury:
 - \$500,000 Each Person
 - \$1,000,000 Each Accident

 - (b) Property Damage:
 - \$1,000,000 Each Occurrence

Add the following sentence to Subparagraph 11.1.3.:

If this Insurance is written on the Comprehensive General Liability Policy form, the Certificates shall be AIA Document G705, Certificates of Insurance. If this Insurance is written on a Commercial General Liability Policy form, ACORD form 255 will be acceptable.

Add the following sentence to Clause 11.3.1.1.:

The form of policy for this coverage shall be Complete Value.

Delete Clause 11.3.1.4 and substitute the following:

11.3.1.4 The Contractor shall provide insurance coverage for portions of the Work stored off the site after written approval of the Owner at the value established in the approval, and also for portions of the Work in transit.

11.3.9 Revise third sentence to read:

The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or in accordance with a mediation or litigation award in which case the procedure shall be as directed by the mediator or the Court.

11.3.10 Revise second sentence to read:

The Owner as fiduciary shall in the case of mediation or litigation make settlement with insurers in accordance with the directions of the mediator or the Court. If distribution of insurance proceeds by mediation or litigation is required the mediator or the Court will direct such distribution.

11.4, PERFORMANCE BOND AND PAYMENT BOND

Delete Subparagraph 11.4.1 and substitute the following paragraphs:

11.4.1 For all bids of \$50,000 or more; The Contractor shall furnish bonds covering faithful performance of the Contract and payment of obligations arising hereunder. Bonds may be obtained through the Contractor's usual source and the cost thereof shall be included in the Contract Sum. The amount of each bond shall be equal to 100% percent of the Contract Sum. For bids less than \$50,000, the Owner will direct the Contractor if a bond is required. Bonds may be obtained through the Contractor's usual source and cost thereof is to be indicated on the bond form. If desired by the Owner, the bond amount indicated on the bid form will be added to the contract.

11.4.1.1 The Contractor shall deliver the required bonds to the Owner not later than three days following the date the Agreement is entered into, or if the Work is to be commenced prior thereto in response to a letter of intent, the Contractor shall, prior to the commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished.

11.4.1.2 The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

Add the following Paragraph 13.8 to Article 13:

13.8 EQUAL OPPORTUNITY

13.8.1 The Contractor shall maintain policies of employment as follows:

13.8.1.1 The Contractor and the Contractor's Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, or national origin. The Contractor shall take affirmative action to insure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.

13.8.1.2 The Contractor and the Contractor's Subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf; state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex or national origin.

ARTICLE 15, CLAIMS AND DISPUTES

15.3 Mediation

15.3.2 Delete reference to Arbitration and substitute litigation.

15.3.2 Revise paragraph to read:

The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be in accordance with the Construction Industry Mediation Rules of the American Arbitration Association in effect on the date of this agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the American Arbitration Association. The request may be made concurrently with the filing for litigation but, in such event, mediation shall proceed in advance of litigation or legal or equitable proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or Court order.

15.4 Delete reference to arbitration. Binding dispute resolution shall be by litigation in a court of law having jurisdiction.

15.4.4 CONSOLIDATION OR JOINDER

15.4.4.1, 15.4.4.2, 15.4.4.3
Delete reference to arbitration and substitute mediation

END OF SECTION 00810

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SECTION 00851 - INDEX OF DRAWINGS

The following drawings, dated May 17, 2013, are issued for Warren Woods Public Schools, Tower High School, POHI Toilet Room Renovations, Warren, Michigan. Architect's Project Number 131480.

TITLE SHEET

SHEET NO. TITLE

ARCHITECTURAL

LS-1.1	COMPOSITE FIRST FLOOR PLAN
LS-1.2	COMPOSITE FIRST FLOOR PLAN
A-1.1	ENLARGED TOILET ROOM FLOOR, DEMOLITION, FINISHES, CEILING, FOUNDATION AND FRAMING PLANS, DOOR SCHEDULE AND ROOM FINISH SCHEDULES
A-4.0	WALL SECTIONS AND DETAILS
A-6.0	INTERIOR ELEVATIONS

MECHANICAL

M-1.1	ENLARGED TOILET ROOM PLANS - DEMOLITION AND NEW WORK
E-1.1	ELECTRICAL LIGHTING, POWER AND DEMOLITION PLANS, ELECTRICAL SPECIFICATIONS

END OF SECTION 00851

SECTION 01010 - SUMMARY OF WORK AND SCHEDULE

PART I - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this section.

1.02 PROJECT:

- A. The project consists of renovations in the designated first floor POHI Toilet Rooms of Warren Woods Tower High School, 27900 Bunert Road, Warren, MI 48088. Renovations include new POHI toilet room layout, with larger door openings, associated mechanical and electrical renovations, new ceilings, wall and flooring finishes. Mandatory Alternates are also being solicited for conversion of a staff toilet room to a new POHI unisex shower room and for providing custom manufactured cabinets in lieu of pre-manufactured cabinets.

1.03 CONTRACT:

A single lump sum proposal will be received for the work of this proposal.

1.04 SCHEDULE:

The Contractor may start work on this project on Monday, June 17, 2013. Project must be substantially complete by Friday, August 16, 2013.

PARTS 2 & 3 - PRODUCT AND EXECUTION

Not applicable

END OF SECTION 01010

SECTION 01041 - PROJECT COORDINATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to other Sections of Division 1, General Requirements, which are hereby made a part of this Section.

1.02 DESCRIPTION:

- A. Contractor shall provide the services of a full time Project Coordinator for the duration of the construction work.
 - 1. Employ someone with not less than ten years experience performing coordination work on projects of similar size and scope.
 - 2. Submit name and qualifications to Architect.
- B. Provide additional administrative and supervisory personnel as required for the performance of the work including coordination of the various subcontractors.
- C. Related Requirements Specified in Other Sections:
 - 1. Summary of Work: Section 01010.

1.03 PROJECT COORDINATOR'S DUTIES:

- A. Coordinate the work of the various subcontractors:
 - 1. For temporary utilities.
 - 2. With the work of trades specified in Division 2 through 16.
- B. Coordinate the schedules of subcontractors.
 - 1. Verify timely deliveries of products for installation by other trades.
 - 2. Verify that labor and materials are adequate to maintain schedules.

- C. Maintain conferences among subcontractors and other concerned parties, as necessary to:
1. Maintain coordination and schedules.
 2. Resolve matters in dispute.
- D. Participate in project meetings:
1. Report progress of work.
 2. Recommend needed changes in schedule.
- E. Temporary Utilities:
1. Coordinate installation, operation and maintenance, to verify compliance with project requirements and with Contract Documents.
 2. Verify adequacy of service at required locations.
- F. Shop Drawings, Product Data and Samples:
1. Prior to submittal, review for compliance with Contract Documents.
 - a. Check field dimensions and clearance dimensions.
 - b. Check relation to available space.
 - c. Review the effect of any changes on the work of other contracts or trades.
 - d. Check compatibility with equipment and work of other trades.
- G. Coordination Drawings:
1. Prepare, as required to assure coordination of work or to resolve conflicts.
 2. Submit for review and transmittal.
 3. Reproduce and distribute approved copies to all concerned parties.

- H. Observe required testing; maintain a record of tests:
1. Testing agency and name of inspector.
 2. Subcontractor.
 3. Manufacturer's representative present.
 4. Date and time of testing.
 5. Type of product or work.
 6. Type of test and results.
 7. Retesting required.
- I. Verify that subcontractors maintain accurate record documents.
- J. Substitutions and Changes:
1. Review proposals and requests.
 - a. Check for compliance with Contract Documents.
 - b. Verify compatibility with work and equipment of other trades.
 2. Promptly report deficiencies or discrepancies to The General Contractor.
- K. Assemble documentation for handling of claims or disputes.
- L. Equipment Start-Up:
1. Check to assure that utilities and specified connections are complete and that equipment is in operable condition.
 2. Observe test, adjust and balance.
 3. Record results, including time and date of start-up.

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M. Inspection and Acceptance of Work:

1. Prior to inspection, check that work is complete and ready for acceptance
2. Assist Inspector: Prepare list of items to be completed or corrected.
3. Should acceptance of work constitute the beginning of the specified guarantee period, prepare and transmit written notice to Contractor for the Owner.

N. Assemble record documents from subcontractors.

END OF SECTION 01041

SECTION 01045 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for cutting and patching.
- B. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
 - 1. Requirements of this Section apply to mechanical and electrical installations. Refer to Division-15 and Division-16 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.
- C. Demolition of selected portions of the building for alterations is included in Section 02070 "Selective Demolition."

1.3 SUBMITTALS

- A. Cutting and Patching Proposal: Where approval of procedures for cutting and patching is required before proceeding, submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:
 - 1. Describe the extent of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.
 - 2. Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
 - 3. List products to be used and firms or entities that will perform Work.
 - 4. Indicate dates when cutting and patching is to be performed.

5. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.
6. Where cutting and patching involves addition of reinforcement to structural elements, submit details and engineering calculations to show how reinforcement is integrated with the original structure.
7. Approval by the Architect to proceed with cutting and patching does not waive the Architect's right to later require complete removal and replacement of a part of the Work found to be unsatisfactory.

1.4QUALITY ASSURANCE

- A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.
- B. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.
- C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner.

PART 2 - PRODUCTS

2.1MATERIALS

- A. Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of existing materials.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.
 - 1. Before proceeding, meet at the site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.
- C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

3.3 PERFORMANCE

- A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.
 - 1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

- B. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.
1. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
 3. Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill.
 4. Comply with requirements of applicable Sections of Division-2 where cutting and patching requires excavating and backfilling.
 5. By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.
- C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
 2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 3. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary to achieve uniform color and appearance.
 - a. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken containing the patch, after the patched area has received primer and second coat.

4. Patch, repair or rehang existing ceilings (not scheduled for replacement) as necessary to provide an even plane surface of uniform appearance.

3.4 CLEANING

- A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION 01045

SECTION 01090 - REFERENCE STANDARDS

PART 1 - GENERAL

1.01 SECTION INCLUDES:

- A. Quality assurance.
- B. Schedule of references.

1.02 QUALITY ASSURANCE:

- A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date for receiving bids.
- C. Obtain copies of standards when required by Contract Documents.
- D. Maintain copy at job site during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- F. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.04 SCHEDULE OF REFERENCE:

- AA Aluminum Association
900 19th Street, N.W. - Suite 300
Washington, DC 20006
- AABC Associated Air Balance Council
1518 K Street N.W.
Washington, DC 20005
- AASHTO American Association of State Highway
and Transportation Officials
444 North Capitol Street, N.W. - Suite 249
Washington, DC 20001

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ACI American Concrete Institute
P.O. Box 9094
Farmington Hills, MI 48333-9094

ADC Air Diffusion Council
1901 N. Roselle Rd., Suite 800
Schaumburg, IL 60195

AF&PA American Forest & Paper Association
1111 19th Street, NW, Suite 800
Washington, DC 20036

AGC Associated General Contractors of America
2300 Wilson Blvd., Suite 400
Arlington, VA 22201

AI Asphalt Institute
2696 Research Park Drive
Lexington, KY 40511-8480

AIA American Institute of Architects
1735 New York Avenue, N.W.
Washington, DC 20006-5292

AISC American Institute of Steel Construction
One East Wacker Drive
Suite 3100
Chicago, IL 60601-2001

AISI American Iron and Steel Institute
1140 Connecticut Ave - Suite 705
Washington, DC 20036

AITC American Institute of Timber Construction
7012 S. Revere Parkway - Suite 140
Englewood, CO 80112

AMCA Air Movement and Control Association
30 West University Drive
Arlington Heights, IL 60004

ANSI American National Standards Institute
25 West 43rd Street, Fourth Floor
New York, NY 10036

APA American Plywood Association
Box 11700
Tacoma, WA 98411-0700

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ARI Air Conditioning and Refrigeration Institute
4100 North Fairfax Drive - Suite 200
Arlington, VA 22203

ASHRAE American Society of Heating, Refrigeration and
Air Conditioning Engineers
1791 Tullie Circle, N.E.
Atlanta, GA 30329

ASME American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5990

ASTM American Society for Testing and Materials
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959

AWI Architectural Woodwork Institute
46179 Westlake Drive, Suite 120
Potomac Falls, VA 20165

AWPA American Wood-Preservers' Association
P.O. Box 5690
Grandbury, TX 76049

AWS American Welding Society
550 N.W. LeJeune Road
Miami, FL 33126

AWWA American Water Works Association
6666 West Quincy Avenue
Denver, CO 80235

BIA Brick Institute of America
1350 Centennial Park Drive, Suite 301
Reston, VA 20191

CDA Copper Development Association
260 Madison Avenue - 16th Floor
New York, NY 10016

CLFMI Chain Link Fence Manufacturers Institute
10015 Old Columbia Road, Suite B-215
Columbia, MD 21046

CRSI Concrete Reinforcing Steel Institute
933 Plum Grove Road
Schaumburg, IL 60173-4758

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CSSB Cedar Shake and Shingle Bureau
P.O. Box 1178
Sumas, WA 98295-1178

DHI Door and Hardware Institute
14150 Newbrook Drive, Suite 200
Chantilly, VA 20151

EJCDC Engineers' Joint Contract Documents Committee
American Council of Engineering Companies
1015 15th Street, N.W., 8th Floor
Washington, DC 20005

EJMA Expansion Joint Manufacturers Association
25 North Broadway
Tarrytown, NY 10591

FGMA Flat Glass Marketing Association
3310 Harrison
White Lakes Professional Building
Topeka, KS 66611

FM Factory Mutual System
Standards Laboratories Department
1151 Boston-Providence Turnpike
Norwood, MA 02062

FS Federal Specification
General Services Administration
Specifications and Consumer Information
Distribution Section (WFSIS)
1800 F Street, NW
Washington, DC 20405

GA Gypsum Association
810 First Street N.W. #510
Washington, DC 20002-4268

ICC International Code Council
5203 Leesburg Pike, Suite 600
Falls Church, VA 22041

IEEE Institute of Electrical and Electronics Engineers
345 East 47th Street
New York, NY 10017

IMIAC International Masonry Industry All-Weather Council
International Masonry Institute
815 15th Street, N.W.
Washington, DC 20005

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MBMA Metal Building Manufacturer's Association
1300 Sumner Avenue
Cleveland, OH 44115-2351

MFMA Maple Flooring Manufacturers Association
60 Revere Drive
Northbrook, IL 60062

MIL Military Specification
Naval Publications and Forms Center
700 Robbins Avenue, Building 4, Section D
Philadelphia, PA 19111-5093

ML/SFA Metal Lath/Steel Framing Association
Division of National Association of Architectural Metal
Manufacturers (NAAMM MLIFSA)
600 South Federal Street, Suite 400
Chicago, IL 60605

NAAMM National Association of Architectural Metal
Manufacturers
800 Roosevelt Road, Building C, Suite 312
Glen Ellyn, IL 60137

NCMA National Concrete Masonry Association
2302 Horse Pen Road
Herndon, VA 22071-3499

NEBB National Environmental Balancing Bureau
8575 Grovement Circle
Gaithersburg, MD 20877

NEMA National Electrical Manufacturers' Association
1300 North 17th Street, Suite 1752
Rosslyn, VA 22209

NFPA National Fire Protection Association
#1 Battery March Park
Quincy, MA 02269-9101

NSWMA National Solid Wastes Management Association
4301 Connecticut Avenue, N.W., Suite 300
Washington, DC 20008-2304

NTMA National Terrazzo and Mosaic Association
201 North Maple, Suite 208
Purcellville, VA 20132

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PCA Portland Cement Association
5420 Old Orchard Road
Skokie, IL 60077

PCI Precast Prestressed Concrete Institute
175 W. Jackson Blvd.-Suite 1859
Chicago, IL 60604-9773

PS Product Standard
U.S. Department of Commerce
1401 Constitution Avenue, N.W.
Washington, DC 20230

RIS Redwood Inspection Service
Division of California Redwood Association
405 Enfrente Drive
Novato, CA 94949

SDI Steel Deck Institute
P.O. Box 25
Fox River Grove, IL 60021

SDI Steel Door Institute
c/o Wherry Associates
30200 Detroit Road
Cleveland, OH 44145-1967

SIGMA Sealed Insulating Glass Manufacturers Association
401 N. Michigan Avenue
Chicago, IL 60611

SJI Steel Joist Institute
3127 10th Avenue North
Myrtle Beach, SC 29577-6760

SMACNA Sheet Metal and Air Conditioning Contractors'
National Association
4201 Lafayette Center Drive
Chantilly, VA 20151-1209

SSPC Society for Protective Coatings
40 24th Street, 6th Floor
Pittsburgh, PA 15222-4656

TCNA Tile Council of North America, Inc.
100 Clemson Research Blvd.
Anderson, SC 29625

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TPI Turfgrass Producers International
2 East Main Street
East Dundee, IL 60118

UL Underwriters' Laboratories, Inc.
333 Pfingston Road
Northbrook, IL 60062-2096

WCLIB West Coast Lumber Inspection Bureau
6980 S.W. Varns Road
Tigard, OR 97223

WDMA Window & Door Manufacturers Associations
1400 W. Touhy Avenue, Suite 470
Des Plaines, IL 60018

WWPA Western Wood Products Association
522 SW Fifth Avenue, Suite 500
Portland, OR 97204-2122

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION 01090

SECTION 01100 - ALTERNATES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this Section.

1.02 DESCRIPTION OF WORK:

- A. This section identifies each Alternate by number, and describes the basic changes to be incorporated into the work, only when the Alternate is made a part of the work by specific provisions in the Owner-Contractor Agreement.
- B. Alternate schedule below is part of the Bidding Documents and will be considered in selection of Contractors and awarding contracts.
- C. Unless otherwise provided, Owner will accept or reject alternates within sixty (60) days of date of contract. Owner reserves the right to reject any or all alternates.

1.03 ALTERNATES:

A. General:

- 1. The descriptions for each alternate listed in the schedule are primarily scope definitions, and do not necessarily detail the full range of materials and processes needed to complete the work as required.
- 2. Refer to applicable specification sections (Division 2 through 16), and to applicable drawings, for specific requirements of the work, regardless of whether references are so noted in description of each alternative.
- 3. Coordinate pertinent related work and modify surrounding work as required to properly integrate the work under each Alternate, and to provide the complete construction required by Contract Documents.
- 4. Referenced sections of specifications stipulate pertinent requirements for products and methods to achieve the work stipulated under each Alternate.

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B. Schedule:

1. **Alternate No. 1:** Provide all required labor, materials and facilities required to convert the designated existing staff toilet room to a new POHI unisex shower as indicated on the drawings.
2. **Alternate No. 2:** Provide all required labor, materials and facilities required to provide and install custom plastic laminate cabinets per Spec Section 06402 "Interior Architectural Woodwork" in lieu of pre-manufactured plastic laminate casework per Spec Section 12300 "Plastic Laminate Casework".

END OF SECTION 01100

SECTION 01200 - PROJECT MEETINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for project meetings including but not limited to:
 - 1. Pre-Construction Conference.
 - 2. Pre-Installation Conferences.
 - 3. Coordination Meetings.
 - 4. Progress Meetings.
- B. Construction schedules are specified in Specification Section 01310 "Construction Schedules".

1.3 PRE-CONSTRUCTION CONFERENCE

- A. Schedule a pre-construction conference and organizational meeting at the Project site or other convenient location no later than (15) days after execution of the Agreement and prior to commencement of construction activities. Conduct the meeting to review responsibilities and personnel assignments.
- B. Attendees: The Owner, Architect and their consultants, the Contractor and its superintendent, major subcontractors, manufacturers, suppliers and other concerned parties shall each be represented at the conference by persons familiar with and authorized to conclude matters relating to the work.
- C. Agenda: Discuss items of significance that could affect progress including such topics as:
 - 1. Tentative construction schedule.
 - 2. Critical work sequencing.
 - 3. Designation of responsible personnel.
 - 4. Procedures for processing field decisions and Change Orders.
 - 5. Procedures for processing Applications for Payment.
 - 6. Distribution of Contract Documents.

7. Submittal of Shop Drawings, Product Data and Samples.
8. Preparation of record documents.
9. Use of the premises.
10. Office, Work and storage areas.
11. Equipment deliveries and priorities.
12. Safety procedures.
13. First aid.
14. Security.
15. Housekeeping.
16. Working hours.

1.4PRE-INSTALLATION CONFERENCES

- A. Conduct a pre-installation conference at the site before each construction activity that requires coordination with other construction. The Installer and representatives of manufacturers and fabricators involved in or affected by the installation, and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise the Architect of scheduled meeting dates.

1. Review the progress of other construction activities and preparations for the particular activity under consideration at each pre-installation conference, including requirements for:
 - a. Contract Documents.
 - b. Options.
 - c. Related Change Orders.
 - d. Purchases
 - e. Deliveries.
 - f. Shop Drawings, Product Data and quality control Samples.
 - g. Possible conflicts.
 - h. Compatibility problems.
 - i. Time schedules.
 - j. Weather limitations.
 - k. Manufacturer's recommendations.
 - l. Compatibility of materials.
 - m. Acceptability of substrates.
 - n. Temporary facilities.
 - o. Space and access limitations.
 - p. Governing regulations.
 - q. Safety.
 - r. Inspection and testing requirements.
 - s. Required performance results.
 - t. Recording requirements.
 - u. Protection.

2. Record significant discussions and agreements and disagreements of each conference, along with the approved schedule. Distribute the record of the meeting to everyone concerned, promptly, including the Owner and Architect.
3. Do not proceed if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene the conference at the earliest feasible date.

1.5 COORDINATION MEETINGS

- A. Conduct Project coordination meetings at regularly scheduled times convenient for all parties involved. Project coordination meetings are in addition to specific meetings held for other purposes, such as regular progress meetings and special pre-installation meetings.
- B. Request representation at each meeting by every party currently involved in coordination or planning for the construction activities involved.
- C. Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.6 PROGRESS MEETINGS

- A. Conduct progress meetings at the Project site at regularly scheduled intervals. Notify the Owner and Architect of scheduled meeting dates. Coordinate dates of meetings with preparation of the payment request.
- B. Attendees: In addition to representatives of the Owner and Architect, each subcontractor, supplier or other entity concerned with current progress or involved in planning, coordination or performance of future activities shall be represented at these meetings by persons familiar with the Project and authorized to conclude matters relating to progress.
- C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of the Project.

1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time, ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 2. Review the present and future needs of each entity present, including such items as:
 - a. Interface requirements.
 - b. Time.
 - c. Sequences.
 - d. Deliveries.
 - e. Off-site fabrication problems.
 - f. Access.
 - g. Site utilization.
 - h. Temporary facilities and services.
 - i. Hours of Work.
 - j. Hazards and risks.
 - k. Housekeeping.
 - l. Quality and Work standards.
 - m. Change Orders.
 - n. Documentation of information for payment requests.
- D. Reporting: No later than (3) days after each progress meeting date, distribute copies of minutes of the meeting to each party present and to other parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
1. Schedule Updating: Revise the construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01200

SECTION 01310 - CONSTRUCTION SCHEDULES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to other Sections of Division 1, General Requirements, which are hereby made a part of this Section.

1.02 DESCRIPTION OF REQUIREMENTS:

- A. General: This section specifies the particular administrative and procedural requirements for progress time scheduling and progress reporting for the performance of the work, as indicated in the General Conditions and elsewhere in the Contract Documents. Refer also to the General Conditions and to the "Contractor" for definition and specific dates of the Contract Time.
- B. Scheduling Responsibility: Submission of Contractor's progress schedule to the Owner and/or Architect shall not relieve the Contractor of his total responsibility for scheduling, sequencing and pursuing the work to comply with the requirements of the Contract Documents, including adverse effects such as delays resulting from ill-timed work; refer to General Conditions.

1.03 FORM OF SCHEDULES:

- A. Contractor shall prepare a "Plan of Operations and Progress Schedule" which shall show concisely the manner in which different phases of the work are to be started, methods and speed for the inter-relationship of the work under the various contracts, times upon which different phases of the work are to be started, methods and speed for progressing the different phases and dates upon which the certain subcontractors are dependent upon that under other subcontracts.
- B. The plan of operations and progress schedule shall be "weighed" to schedule each trade in proportion to the entire project, both physically and financially.
- C. In preparing the above plan of operations and progress schedule, the Contractor shall assure that the dates and other pertinent matters are acceptable to the Architect and, when completed, he shall submit to and obtain approval from the Architect.

- D. After approval of the above plan of operations and progress schedule, the Contractor shall be responsible for seeing that it is adhered to and for ascertaining that proper coordination is maintained between work of all Contracts.

1.04 PROGRESS REVISIONS:

- A. Indicate progress of each activity to date of submission.
- B. Show changes occurring since previous submission of schedule:
 - 1. Major changes in scope.
 - 2. Activities modified since previous submission.
 - 3. Revised projections of progress and completion.
 - 4. Other identifiable changes.
- C. Provide a narrative report as needed to define:
 - 1. Problem areas, anticipated delays, and the impact on the schedule.
 - 2. Corrective action recommended and its effect.
 - 3. The effect of changes on schedules of other contractors.

1.05 SUBMISSIONS:

- A. Submit initial schedules within (14) days after award of Contract.
 - 1. Architect and Owner will review schedules and return review copy within (10) days after receipt.
 - 2. Resubmit within (10) days after return of review copy.
- B. Submit a revised and updated progress schedule and narratives with each application for payment, but not less than once a month until project is complete.

1.06 DISTRIBUTION:

- A. Distribute copies of the reviewed schedules and narratives to:
 - 1. Job site file.
 - 2. Subcontractors.
 - 3. Other concerned parties.
- B. Instruct recipients to report promptly to the Contractor, in writing, any problems anticipated by the projections shown in the schedules.

1.07 DAILY REPORTS:

- A. Contractor shall prepare a daily report, recording the following information concerning events at the site and submit duplicate copies to the Architect and Owner at regular intervals not exceeding weekly intervals.
 - 1. List of subcontractors at the site.
 - 2. List of separate contractors at the site.
 - 3. Count of personnel at the site.
 - 4. High/low temperatures, general weather conditions.
 - 5. Accidents (refer to accident reports).
 - 6. Meetings and significant decisions.
 - 7. Unusual events.
 - 8. Stoppages, delays, shortages, losses.
 - 9. Emergency procedures, field orders.
 - 10. Orders/requests by governing authorities.
 - 11. Change orders received, implemented.

PART 2 and 3 - PRODUCTS AND EXECUTION - Not Applicable

END OF SECTION 01310

SECTION 01340 - SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to other Sections of Division 1, General Requirements, which are hereby made a part of this Section.

1.02 DESCRIPTION:

- A. Submit shop drawings, product data and samples as required by the Contract Documents. Individual submittal requirements are specified in applicable sections for each unit of work. Receive, check and coordinate all submittals of contractors as provided herein.
- B. Definitions:
 - 1. Shop Drawings are drawings, diagrams, schedules and other data specifically prepared for the Work by the Contractor or any subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.
 - 2. Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate a material, product or system for some portion of the Work.
 - 3. Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the work will be judged.

1.03 SUBMITTAL REQUIREMENTS:

- A. Coordinate preparation and processing of submittals with performance of the work so that work will not be delayed by submittals. Coordinate and sequence different categories of submittals for the same work, and for interfacing units of work, so that one will not be delayed for coordination with another. No extension of time will be allowed because of failure to properly coordinate and sequence submittals.

- B. Submit one reproduction transparency and the two (2) prints of each shop drawing, including fabrication, erection, layout and setting drawings and such other drawings as required under various sections of the Specifications, until final acceptance is obtained. Prepare drawings legible, drawing plans, elevations, sections and details in scales required and on drawing sheets not larger than 30" x 42" nor smaller than 24" x 30". Submit copies of manufacturer's descriptive data including catalog sheets for materials, equipment and fixtures, showing dimensions, performance characteristics and capacities, wiring diagrams and controls, schedules, and other pertinent information as required. Where printed materials describe more than one product or model, clearly identify which is to be furnished.
- C. Shop drawings, product data and samples shall be dated including Contractor and Subcontractor dates of submittal and approval, and marked to show the names of the Project, Architect, Contractor, origination Subcontractor, manufacturer or supplier, and separate detailer if pertinent. Shop drawings shall completely identify Specification section and locations at which materials or equipment are to be installed. Reproductions of Contract Drawings are acceptable as Shop Drawings only when specifically authorized in writing by the Architect.
- D. Submission of shop drawings, product data and samples shall be accompanied by a copy of a transmittal letter containing Project name, Contractor's name, number of drawings, and samples, titles and other pertinent data. Transmittal shall bear signature of the Contractor as evidence he checked same and found them in conformance with the Contract Documents.
- E. The Contractor shall review, approve and submit, with reasonable promptness and in such sequence as to cause no delay in the Work or in the work of the Owner or any separate contractor, all Shop Drawings, Product Data and Samples required by the Contract Documents.
- F. By approving and submitting Shop Drawings, Product Data and Samples, the contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that he has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

- G. The Contractor shall not be relieved of responsibility for the deviation from the requirements of the Contract Documents by the Architect's acceptance of Shop Drawings, Product Data or Samples under Section 3.12 of the General Conditions, unless the Contractor has specifically informed the Architect in writing of such deviation at the time of subdeviation. The Contractor shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data or Samples by the Architect's acceptance thereof.
- H. The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data or Samples, to revisions other than those requested by the Architect on previous submittals.
- I. No portion of the Work requiring submission of a Shop Drawing, Product Data or Sample shall be commenced until the submittal has been accepted by the Architect as provided in Section 3.12 of the General Conditions. All such portions of the Work shall be in accordance with approved submittals.
- J. Architect will review Shop Drawings, Product Data and Samples as provided in Section 3.12 of the General Conditions. He will mark each such submittal as follows:
1. Accepted - Where no comment made.
 2. Accepted as Noted - Where comments indicated on submittal qualifying, modifying, or otherwise changing it; however, submittal can be used for ordering, fabrication and erection at contractor's own risk until revised submittals have been made, reviewed and stamped acceptable.
 3. Not Accepted - Submittal not in conformance; revise and resubmit. Acceptance does not authorize any changes in the Contract Documents unless specifically stated in a separate letter or change order.
- K. Contractor is responsible for obtaining and distributing required prints of shop drawings to his subcontractors and material suppliers; after as well as before final approval. Prints of reviewed shop drawings shall be made from transparencies which carry the Architect's appropriate stamp.

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- L. Obtain copies of all shop drawings, product data and samples submitted to date and accepted from other contractors.

PARTS 2 and 3 - PRODUCT AND EXECUTION

Not applicable.

END OF SECTION 01340

SECTION 01370 - SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to other Sections of Division 1, General Requirements, which are hereby made a part of this Section.

1.02 DESCRIPTION OF WORK:

- A. Submit to the Architect a Schedule of Values allocated to the various portions of the work, within (10) ten days after award of contract.
- B. Upon request of the Architect, support the values with data which will substantiate their correctness.
- C. The Schedule of Values, unless objected to by the Architect or Owner, shall be used only as the basis for the Contractor's Applications for Payment.

1.03 FORM AND CONTENT OF SCHEDULE OF VALUES:

- A. Use AIA Forms G702 and G702A or forms provided by Owner.
- B. Schedule shall list the installed value of the component parts of the work in sufficient detail to serve as a basis for computing values for progress payments during construction.
- C. Follow the table of contents of Sections as the format for listing component items.
 - 1. Identify each line item with the number and title of the respective major section of the specifications.
- D. For each major line item list sub-values of major products or operations under the item.
 - 1. Each item shall include a directly proportional amount of the Contractor's overhead and profit.
- E. The sum of all values listed in the schedules shall equal the total Contract Sum.

PARTS 2 AND 3 - PRODUCTS AND EXECUTION - Not Applicable

END OF SECTION 01370

SECTION 01400 - QUALITY CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this Section.

1.02 DESCRIPTION:

- A. Specific quality control requirements for the work are indicated throughout the contract documents. The term "Quality Control" includes, but is not necessarily limited to, inspection and testing and associated requirements. This section does not specify or modify Architect's duties relating to quality control and Contract enforcement.
- B. Coordinate quality control programs of separate contractors including submittals, conferences and on site programs.

1.03 RESPONSIBILITY:

- A. Residual Contractor Responsibility: Whatever required, inspection, testing and similar quality control provisions to be performed by independent agencies (not directly by the Contractor), and not indicated to be Owner's responsibility, shall be the Contractor's responsibility. The costs for those required services by independent testing laboratories are recognized to be included in Contract Sum.
- B. Contractor's General Responsibility: No failure of test agencies, whether engaged by Owner or Contractor, to perform adequate inspections or tests or to properly analyze or report results, shall relieve Contractor of responsibility for fulfillment of requirements of contract documents. It is recognized that required inspection and testing program is intended to assist the Contractor, Owner, Architect, and governing authorities in nominal determination of probable compliances with requirements for certain elements of work. The program is not intended to limit the Contractor's regular quality control program, as needed for general assurance of compliances.

1.04 QUALITY ASSURANCE:

- A. General Workmanship Standards: Comply with recognized workmanship quality standards within the industry as applicable to each unit of work, including ANSI standards where applicable. It is a requirement that each category of trades person or installer performing the work be prequalified, to the extent of being familiar with applicable and recognized quality standards for that category of work, and being capable of workmanship complying with those standards.
- B. Qualification of Quality Control Agencies: Except where another qualification standard is indicated, and except where it is specifically indicated that use of prime product manufacturer's test facilities is acceptable, engage independent testing laboratories complying with "Recommended Requirements for Independent Laboratory Qualifications" as published by American Council of Independent Laboratories, and specializing in type(s) of inspections and tests required.

1.05 SUBMITTALS:

- A. General: Refer to Section 01340, Shop Drawings, Product Data and Samples for requirements applicable to inspection and test reports, quality control samples, maintenance agreements, warranties, and similar documentation of quality compliances as required. Refer to individual work sections of Division 2 through 16 for specific certification and submittal requirements.
- B. Copies and Distribution: Where inspection and test reports and certifications are required by governing authorities, provide additional copies as required, and where required, send copies directly from inspection or testing agency to governing authority.

1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING:

- A. General: Handle, store and protect materials and products, including fabricated components, by methods and means which will prevent damage, deterioration and losses including theft (and resulting delays), thereby ensuring highest quality results as performance of the work progresses. Control delivery schedules so as to minimize unnecessary long-term storage at project site prior to installation.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION:

3.01 PREPARATION FOR INSTALLATION:

- A. Pre-Installation Conferences: Well in advance of installation of every major unit of work which requires coordination with other work, meet at the project site with installers and representatives of manufacturers and fabricators who are involved in or affected by the unit of work, and in its coordination or integration with other work which has proceeded or will follow. Advise Architect and Owner of scheduled meeting dates. At each meeting, review progress of other work and preparations for particular work under consideration, including requirements of contract documents, options, related change orders, purchases, deliveries, shop drawings, product data, quality control samples, possible conflicts, compatibility problems, time schedule, weather limitations, temporary facilities, space and access limitations, structural limitations, governing regulations, safety, inspection and testing requirements required performance results, recording requirements, and protection. Record significant discussions of each conference, and agreements and disagreements along with final plan of action. Distribute record of meeting promptly to everyone concerned, including Architect and Owner.
1. Do not proceed with the work if associated pre-installation conference cannot be concluded successfully. Instigate actions to resolve impediments to performance of the work, and reconvene conference at earliest date feasible.
- B. Installer's Inspection of Conditions: Require Installer of each major unit of work to inspect substrate to receive the work, and conditions under which the work will be performed, and to report (in writing to the General Contractor) unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.02 COORDINATION OF TEST AGENCY WORK:

- A. Coordination with Owner's Agencies: Afford access and reasonable time in construction sequence for Owner's inspection and tests to be performed. Cooperate with agencies and provide incidental labor and services needed for the removal and delivery of test samples, and for inspections and taking measurements. Provide patching and restoration services where test samples have been removed, complying with individual technical sections of Divisions 2 through 16.
1. Except for specialized laboratory sampling equipment, and except as otherwise indicated, supply and operate tools and construction equipment needed to obtain test samples from the work, including cutting devices for sawing, drilling, flame-cutting, coring and similar operations. Assist agencies in labeling and packing of test samples removed from the work.
- B. Coordination with Contractor's Independent Agencies: Except for required independent agency activities of inspection, measuring, testing, analyzing, reporting and similar activities, the assignment of labor, equipment, cutting, Patching and similar necessary activities associated therewith are Contractor's option recognizing that entire activity is Contractor's responsibility.
- C. Test Agency Responsibilities:
1. Test agencies, regardless of whether engaged by Owner or Contractor, are not authorized to change or negate requirements of Contract Documents. Each agency shall coordinate its assigned work with construction schedule as maintained by Contractor, and shall perform its work promptly so as not to delay the work. Observances (by agencies) having a bearing on the work shall be reported to Architect in most expeditious way possible, and shall be recorded in writing by agency. Agency personnel shall not interfere with or assume duties of Contractor.
 2. Reports: The testing agency shall prepare reports of inspections and laboratory tests, including analysis and interpretation of test results where applicable. Properly identify each report and, where required, provide agency's certification of test results. Describe test methods used, and compliance with recognized test standards (if any). Complete and submit report at earliest possible date in each case.

3.03 INSTALLATION QUALITY CONTROL:

- A. Manufacturer's Instructions: Where installations include manufactured products, comply with manufacturer's applicable instructions and recommendations for installation, to whatever extent these are more explicit or more stringent than applicable requirements indicate in contract documents.
- B. Inspect each item of materials or equipment, immediately prior to installation, and reject damaged and defective items.
- C. Provide attachment and connection devices and methods for securing work properly as it is installed; true to line and level, and within recognized industry tolerances, if not otherwise indicated. Allow for expansions and building movements. Provide uniform joint widths in exposed work, organized for best possible visual effect. Refer questionable visual effect choices to Architect for final decision.
- D. Recheck measurements and dimensions of the work, as an integral step of starting each installation.
- E. Install work during conditions of temperature, humidity, exposed, forecasted weather, and status of project completion which will ensure best possible results for each unit of work, in coordination with entire work. Isolate each unit of work from non-compatible work, as required to prevent deterioration.
- F. Coordinate enclosure (closing-in) of work with required inspections and tests, so as to avoid necessity of uncovering work for that purpose.
- G. Mounting Heights: Except as otherwise indicated, mount individual units of work at industry-recognized standard mounting heights, for applications indicated. Refer questionable mounting height choices to Architect for final decision.
- H. Adjust, clean, lubricate, restore, marred finished, and protect newly installed work, to ensure that it will remain without damage or deterioration during the remainder of construction period.

END OF SECTION 01400

SECTION 01600 - MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this Section.

1.02 DESCRIPTION:

- A. Material and equipment incorporated into the work:
 - 1. Conform to applicable specifications and standards.
 - 2. Comply with size, make, type and quality specified, or as specifically approved in writing by the Architect.
 - 3. Manufactured and Fabricated Products:
 - a. Design, fabricate and assemble in accord with the best engineering and shop practices.
 - b. Manufacture like parts of duplicate units to standard sizes and gages, to be interchangeable.
 - c. Two or more items of the same kind shall be identical, by the same manufacturer.
 - d. Products shall be suitable for service conditions.
 - e. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.
 - 4. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

1.03 MANUFACTURER'S INSTRUCTIONS:

- A. When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, obtain and distribute copies of such, including three copies to Architect.
 - 1. Maintain one set of complete instructions at the job site during installation and until completion.

- B. Handle, install, connect, clean, condition and adjust products in strict accord with such instructions and in conformity with specified requirements.
 - 1. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Architect for further instructions.
 - 2. Do not proceed with work without clear instructions.
- C. Perform work in accord with manufacturer's instructions. Do not omit preparatory step or installation procedure unless specifically modified or exempted by contract documents.

1.04 TRANSPORTATION AND HANDLING:

- A. Arrange deliveries of products in accord with construction schedules, coordinate to avoid conflict with work and conditions at the site.
 - 1. Immediately on delivery, inspect shipments to assure compliance with requirements of contract documents and approved submittals, and that products are properly protected and undamaged.
- B. Provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

1.05 STORAGE AND PROTECTION:

- A. Store products in accord with manufacturer's instructions, with seals and labels intact and legible.
 - 1. Store products subject to damage by the elements in weathertight enclosures.
 - 2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.
- B. EXTERIOR STORAGE:
 - 1. Store fabricated products above the ground, on blocking or skids, prevent soiling or staining. Cover products which are subject to deterioration with impervious sheet coverings, provide adequate ventilation to avoid condensation.

2. Store any loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.
 - C. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions, and free from damage or deterioration.
 - D. Preparation After Installation:
 1. Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove when no longer needed.
- 1.06 SUBSTITUTIONS AND PRODUCT OPTIONS:
- A. Products List:
 1. Within (15) fifteen days after contract date, submit to Architect a complete list of major products proposed to be used, with the name of the manufacturer and the installing subcontractor. Comply with provisions for Contractor's Options and Substitutions.
 - B. Contractor's Options:
 1. For products specified only by reference standard, select any product meeting that standard.
 2. For products specified by naming several products or manufacturers, select any one of the products or manufacturers named, which complies with the specifications.
 3. For products specified by naming one or more products or manufacturers and "or equal," Contractor must submit a request as for substitutions for any product or manufacturer not specifically named.
 4. For products specified by naming only one product and manufacturer, there is no option.
 - C. Substitutions:
 1. For a period of (15) fifteen days after contract date, Architect will consider written requests from Contractor for substitution of products.

2. Submit a separate request for each product, supported with complete data, with drawings and samples as appropriate, including:
 - a. Comparison of the qualities of the proposed substitution with that specified.
 - b. Changes required in other elements of the work because of the substitution.
 - c. Effect on the construction schedule.
 - d. Cost data comparing the proposed substitution with the product specified.
 - e. Any required license fees or royalties.
 - f. Availability of maintenance service, and source of replacement materials.
3. Architect shall be the judge of the acceptability of the proposed substitution except where a change in cost is involved.

D. Contractor's Representation:

1. A request for a substitution constitutes a representation that Contractor:
 - a. Has investigated the proposed product and determined that it is equal to or superior in all respects to that specified.
 - b. Will provide the same warranties or bonds for the substitution as for the product specified.
 - c. Will coordinate the installation of an accepted substitution into the work, and meet such other changes as may be required to make the work complete in all respects.
 - d. Waives all claims for additional costs, under his responsibility which may subsequently become apparent.

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- E. Architect will review requests for substitutions with reasonable promptness, and notify Contractor, in writing, of the decision to accept or reject the requested substitution.

PARTS 2 AND 3 PRODUCTS AND EXECUTION

Not applicable.

END OF SECTION 01600

SECTION 01700 - PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:
 - 1. Inspection procedures.
 - 2. Project record document submittal.
 - 3. Operating and maintenance manual submittal.
 - 4. Submittal of warranties.
 - 5. Final cleaning.
- B. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions-2 through -16.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.
 - 1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
 - a. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
 - 2. Advise Owner of pending insurance change-over requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.

4. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
5. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.

B. Inspection Procedures: On receipt of a request for inspection, the Architect will either proceed with inspection or advise the Contractor of unfilled requirements. The Architect will prepare the Certificate of Substantial Completion following inspection, or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.

1. The Architect will repeat inspection when requested and assured that the Work has been substantially completed.
2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.4 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
3. Submit a certified copy of the Architect's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Architect.
4. Submit consent of surety to final payment.
5. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Reinspection Procedure: The Architect will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Architect.

1. Upon completion of reinspection, the Architect will prepare a certificate of final acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
2. If necessary, reinspection will be repeated.

1.5 RECORD DOCUMENT SUBMITTALS

- A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Architect's reference during normal working hours.
- B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
 1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.
 2. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.
 3. Note related Change Order numbers where applicable.
 4. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.
- C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.
 1. Upon completion of the Work, submit record Specifications to the Architect for the Owner's records.

- D. Record Product Data: Maintain one copy of each Product Data submittal. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark-up of record drawings and Specifications.
1. Upon completion of mark-up, submit complete set of record Product Data to the Architect for the Owner's records.
- E. Record Sample Submitted: Immediately prior to the date or dates of Substantial Completion, the Contractor will meet at the site with the Architect and the Owner's personnel to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to the Owner for record purposes. Comply with delivery to the Owner's Sample storage area.
- F. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Architect for the Owner's records.
- G. Maintenance Manuals: Organize operating and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual heavy-duty 2-inch, 3-ring vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:
1. Emergency instructions.
 2. Copies of warranties.
 3. Recommended maintenance.
 4. Inspection procedures.
 5. Product Data.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

- A. Operating and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:

1. Maintenance manuals.
2. Record documents.
3. Hazards.
4. Cleaning.
5. Warranties and bonds.
6. Maintenance agreements and similar continuing commitments.

3.2 FINAL CLEANING

- A. General: General cleaning during construction is required by the General Conditions and as required under applicable specifications sections (Division 2 thru 16).
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

1. Clean transparent materials, including glass in doors and windows from any construction debris. Replace chipped or broken glass (from construction debris) and other damaged (during construction activities) transparent materials.
2. Clean exposed exterior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Leave concrete floors broom clean.
3. Clean the construction site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits.

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- C. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.
- D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.
 - 1. Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.

END OF SECTION 01700

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SECTION 01800 - GUARANTEE - WARRANTY

PART ONE - GENERAL

1.01 GUARANTEE PERIOD

- A. The General Contractor shall and hereby does guarantee and warrant that all work for this building, under this Contract, shall be free from defects or faulty labor and/or materials for a period of **one (1) year** from the date of Final Acceptance of same, except when longer periods are herein specified, which develop within any guarantee periods.

1.02 FINAL PAYMENT

- A. Final payment is contingent upon the Owner's Representative's receipt of such guarantees and/or warranties from the General Contractor.

END OF SECTION 01800

SECTION 02070 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section requires the selective removal and subsequent offsite disposal of the following:
 - 1. Portions of existing finishes indicated on drawings and as required to accommodate new finishes.
 - 2. Removal of existing plastic laminate doors and hollow metal frames as indicated on the drawings.
 - 3. Removal and protection of existing fixtures, and equipment items indicated "salvage" and/or return to Owner.
 - 4. Removal of existing concrete slabs, flooring and ceilings indicated or required for new construction.
 - 5. Shoring and removal of existing lintels and masonry walls.
- B. Removal work specified elsewhere:
 - 1. Cutting nonstructural concrete floors and masonry walls for piping, ducts, and conduits is included with the work of the respective mechanical and electrical specification sections in Divisions 15 and 16.
- C. Related work specified elsewhere:
 - 1. Remodeling construction work and patching are included within the respective sections of specifications, including removal of materials for reuse and incorporation into remodeling or new construction.
 - 2. Relocation of pipes, conduits, ducts and other mechanical and electrical work is specified in other divisions.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Schedule indicating proposed sequence of operations for selective demolition work to the Owner for review prior to start of work. Include coordination for shutoff, capping, and continuation of utility services as required, together with details for dust and noise control protection.
- C. Photographs of existing conditions of structure surfaces, equipment, and adjacent improvements that might be misconstrued as damage related to removal operations. File with the Owner prior to start of work.

1.4 JOB CONDITIONS

- A. Occupancy: Owner will occupy portions of the building immediately adjacent to areas of selective demolition. Conduct selective demolition work in manner that will minimize need for disruption of Owner's normal operations. Provide minimum of 72 hours advance notice to Owner of demolition activities that will affect Owner's normal operations.
- B. Condition of Structures: Owner assumes no responsibility for actual condition of items or structures to be demolished.
 - 1. Conditions existing at time of inspection for bidding purposes will be maintained by Owner insofar as practicable. However, minor variations within structure may occur by Owner's removal and salvage operations prior to start of selective demolition work.
- C. Partial Demolition and Removal: Items indicated to be removed but of salvageable value to the Contractor may be removed from structure as work progresses. Transport salvaged items from site as they are removed.
 - 1. Storage or sale of removed items on site will not be permitted.

- D. Protections: Provide temporary barricades and other forms of protection to protect Owner's personnel and general public from injury due to selective demolition work.
1. Provide protective measures as required to provide free and safe passage of Owner's personnel and general public to occupied portions of building.
 2. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or element to be demolished and adjacent facilities or work to remain.
 3. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.
 4. Protect floors with suitable coverings when necessary.
 5. Construct temporary insulated one hour fire rated dustproof partitions where required to separate areas where noisy or extensive dirt or dust operations are performed. Equip partitions with dustproof doors and security locks.
 6. Remove protections at completion of work.
- E. Damages: Promptly repair damages caused to adjacent facilities by demolition work.
- F. Traffic: Conduct selective demolition operations and debris removal to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.
1. Do not close, block, or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- G. Flame Cutting: Do not use cutting torches for removal until work area is cleared of flammable materials. At concealed spaces, such as interior of ducts and pipe spaces, verify condition of hidden space before starting flame-cutting operations. Maintain portable fire suppression devices during flame-cutting operations.

- H. Utility Services: Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations.
 - 1. Do not interrupt utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.
 - 2. Maintain fire protection services during selective demolition operations.
- I. Environmental Controls: Use water sprinkling, temporary enclosures, and other methods to limit dust and dirt migration. Comply with governing regulations pertaining to environmental protection.
 - 1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 PREPARATION

- A. General: Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of areas to be demolished and adjacent facilities to remain.
 - 1. Cease operations and notify the General Contractor, Owner and Architect immediately if safety of structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations.
 - 2. Cover and protect furniture, equipment, and fixtures from soilage or damage when demolition work is performed in areas where such items have not been removed.
 - 3. Erect and maintain fire rated dustproof partitions and closures as required to prevent spread of dust or fumes to occupied portions of the building.

- a. Where selective demolition occurs immediately adjacent to occupied portions of the building, construct fire rated dust-proof partitions of minimum 4-inch studs, 5/8-inch drywall (joints taped) on occupied side, 1/2-inch fire-retardant plywood on demolition side. Fill partition cavity with sound-deadening insulation.
 - b. Provide weatherproof closures for exterior openings resulting from demolition work.
4. Locate, identify, stub off, and disconnect utility services that are not indicated to remain.
- a. Provide bypass connections as necessary to maintain continuity of service to occupied areas of building. Provide minimum of (72) seventy two hours advance notice to Owner if shutdown of service is necessary during changeover.

3.2DEMOLITION

- A. General: Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.
 1. Locate demolition equipment throughout structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors, or framing.
 2. Provide services for effective air and water pollution controls as required by local authorities having jurisdiction.
- B. If unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to the Owner in written, accurate detail. Pending receipt of directive from the Owner, rearrange selective demolition schedule as necessary to continue overall job progress without undue delay.

3.3 SALVAGED MATERIALS

- A. Salvaged Items: Where indicated on Drawings as "Salvage - Deliver to Owner," carefully remove indicated items, clean, store, and turn over to Owner and obtain receipt.
 - 1. Historic artifacts, including cornerstones and their contents, commemorative plaques and tablets, antiques, and other articles of historic significance, remain property of Owner. Notify the General Contractor if such items are encountered and obtain acceptance regarding method of removal and salvage for Owner.

3.4 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove from building site debris, rubbish, and other materials resulting from demolition operations. Transport and legally dispose off site.
 - 1. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.
 - 2. Burning of removed materials is not permitted on project site.

3.5 CLEANUP AND REPAIR

- A. General: Upon completion of demolition work, remove tools, equipment, and demolished materials from site. Remove protections and leave interior areas broom clean.
 - 1. Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to condition existing prior to start operations. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

END OF SECTION 02070

SECTION 02300 - EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Proof-rolling subgrade.
 - 2. Granular fill course for slabs-on-grade.
 - 3. Excavating and backfilling trenches within building lines.
 - 4. Excavating and backfilling trenches for buried mechanical and electrical utilities and pits for buried utility structures is work of Divisions 15 and 16. This section sets forth the requirements of such work.
- B. Related Sections include the following:
 - 1. Section 02530 "Sanitary Sewerage".
 - 2. Section 02635 "Sewer Cleaning".
 - 3. Division 15 and 16 Sections for excavating and backfilling buried mechanical and electrical utilities and buried utility structures.

1.3 DEFINITIONS

- A. Backfill: Soil materials used to fill an excavation.
 - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 - 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.

- C. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.
- D. Compacted: Material at the required compaction or higher.
- E. Excavation: Removal of material encountered above subgrade elevations.
 - 1. Additional Excavation: Excavation below subgrade elevations as directed by Architect. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
 - 2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.
- F. Fill: Soil materials used to raise existing grades.
- G. Maximum Density: The dry density at optimum moisture content in accordance with ASTM D1557 (Modified Proctor).
- H. Required Compaction: The ratio of in-place density to maximum density, expressed as a percentage.
- I. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- J. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
- K. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 SUBMITTALS

- A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
1. Classification according to ASTM D 2487 of each on-site or borrow soil material proposed for fill and backfill.
 2. Laboratory compaction curve according to ASTM D 1557 for each on-site or borrow soil material proposed for fill and backfill.

1.5 QUALITY ASSURANCE

- A. Codes and Standards: Perform earthwork complying with requirements of authorities having jurisdiction.
1. Comply with Michigan Department of Transportation (MDOT), 2003 Standard Specifications for Construction.
- B. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock-definition testing, as documented according to ASTM D 3740 and ASTM E 548.

1.6 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated:
1. Notify the General Contractor not less than (72) seventy two hours in advance of proposed utility interruptions.
 2. Do not proceed with utility interruptions without the Owner's written permission.
 3. Contact MISS DIG before excavating.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, and SM, or a combination of these group symbols; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: ASTM D 2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT, or a combination of these group symbols.
 - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Backfill and Fill: Satisfactory soil materials.
- E. Base: Naturally or artificially graded mixture of natural or crushed gravel or crushed stone complying with MDOT Table 8.02-2 21AA Dense Graded Aggregate.
- F. Engineered Fill: Granular soil material complying with MDOT Table 8.02-3, Class II Granular Material.
- G. Bedding: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.
- H. Granular Fill: Granular soil material complying with MDOT Table 8.02-3, Class II Granular Material.
- I. Pea Gravel: Clean, hard, durable, free flowing, naturally rounded particles of rock, free from clay lumps, with 100% passing a 3/8" sieve and not over 5% passing a #8 sieve.

2.2 ACCESSORIES

A. Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility; colored as follows:

1. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, minimum 6 inches wide and 4 mils thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:
 - a. Red: Electric.
 - b. Yellow: Gas, oil, steam, and dangerous materials.
 - c. Orange: Telephone and other communications.
 - d. Blue: Water systems.
 - e. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.

3.2 PROOF-ROLLING

- A. Prior to concrete slab placement the prepared subgrade shall again be thoroughly proof-rolled. Disturbed areas shall be recompacted or removed and replaced with engineered fill.

- B. Proof-rolling operations must be done in presence of Testing Agency.

3.3 DEWATERING

- A. Subgrade soils are prone to disturbance due to ponded water.
- B. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- C. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
 - 2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3.4 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavation to subgrade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions.
 - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.5 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
- B. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit, unless otherwise indicated.
 - 1. Clearance: As indicated.

- C. Trench Bottoms: Excavate trenches 4 inches deeper than bottom of pipe elevation to allow for bedding course. Hand excavate for bell of pipe.

3.6 APPROVAL OF SUBGRADE

- A. Notify Architect when excavations have reached required subgrade.
- B. If Architect determines based on Testing Agency's recommendation that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
 - 1. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

3.7 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill may be used when approved by Architect.
 - 1. Fill unauthorized excavations under other construction or utility pipe as directed by Architect.

3.8 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow materials and satisfactory excavated soil materials. Stockpile soil materials without intermixing.
 - 1. Stockpile soil materials away from edge of excavations.

3.9 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Construction below finish grade including but not limited to perimeter insulation.

2. Surveying locations of underground utilities for record documents.
3. Inspecting and testing underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring and bracing, and sheeting.

3.10 UTILITY TRENCH BACKFILL

- A. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- B. Backfill trenches excavated under footings and within 18 inches of bottom of footings; fill with concrete to elevation of bottom of footings.
- C. Place and compact initial backfill of base course material, free of particles larger than 1 inch, to a height of 12 inches over the utility pipe or conduit.
 1. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system.
- D. Coordinate backfilling with utilities testing.
- E. Fill voids with approved backfill materials while shoring and bracing, and as sheeting is removed.
- F. Place and compact final backfill of satisfactory soil material to final subgrade.
- G. Install warning tape directly above utilities, except 6 inches below subgrade under slabs.

3.11 FILL

- A. Preparation: Remove vegetation, topsoil, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface before placing fills.
- B. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- C. Place and compact fill material in layers to required elevations as follows:
 - 1. Under building slabs, use engineered fill.
 - 2. Under footings and foundations, use engineered fill.

3.12 MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.
 - 1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.13 COMPACTION OF BACKFILLS AND FILLS

- A. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

- C. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:
 - 1. Under structures, building slabs, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill material at 95 percent.

3.14 GRANULAR FILL COURSE

- A. Under slabs-on-grade, place granular fill course on prepared subgrade and as follows:
 - 1. Compact granular fill course to required cross sections and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.
 - 2. When compacted thickness of drainage course is 6 inches or less, place materials in a single layer.
 - 3. When compacted thickness of drainage course exceeds 6 inches, place materials in equal layers, with no layer more than 6 inches thick or less than 3 inches thick when compacted.

3.15 FIELD QUALITY CONTROL

- A. Testing Agency: Refer to requirements set forth in Spec Section 01400 "Quality Control".
- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- C. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
 - 1. Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 1000 sq. ft. or less of building slab, but in no case fewer than three tests.
 - 2. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 50 feet or less of trench length, but no fewer than two tests.

- D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

3.16 PROTECTION

- A. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations.
 - 1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.
- B. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.17 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION 02300

SECTION 03001 - CONCRETE

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this specification.

1.02 SECTION INCLUDES

- A. Work included in this section includes furnishing all labor, materials, equipment and incidentals required for complete installation of formwork, reinforcement, accessories, cast-in-place concrete, finishing and curing. This section pertains to building concrete work.

1.03 SUBMITTALS

- A. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures". Indicate reinforcement sizes, spacings, locations, and quantities, bending and cutting schedules, supporting and spacing devices.
- B. See drawings for General Notes and Special Conditions.
- C. Provide data on joint devices, attachment accessories, mix design for each type concrete, proportions of all ingredients, admixtures, slump range, expected strength and water cement ratio. Provide historical test data with each proposed mix design.

1.04 QUALITY ASSURANCES

- A. Building Code Requirements for Structural Concrete (ACI 318) and latest supplements thereto.
- B. Standard Practice for Selecting Proportions for Normal, Heavy Weight, and Mass Concrete (ACI 211.1).
- C. "Hot Weather Concreting" (ACI-305R).
- D. "Cold Weather Concreting" (ACI-306R).
- E. Guide for Measuring, Mixing, Transporting and Placing Concrete (ACI 304R).

- F. Standard Practice for Curing Concrete (ACI 308).
- G. Specification for Structural Concrete (ACI 301).
- H. Guide for Concrete Floor and Slab Construction (ACI 302.1R).
- I. Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete (ASTM C618).
- J. Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type) - (ASTM D994).
- K. Guide to Formwork for Concrete (ACI 347R).
- L. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice.
- M. Design and workmanship of all concrete shall be in accordance with referenced specifications and code listed above. Quality, tolerances, and level of performance of work shall be as specified therein. Contractor shall keep on file, in project office, current copies of all references listed above.

PART 2. PRODUCTS

2.01 FORM MATERIALS

- A. Form Material for Exposed Concrete: Plywood; 5/8" APA B-B plyform Class 1, exterior. Use plywood thickness sufficient to support concrete at temperature and rate of pour. Use only sound, undamaged sheets with clean, true edges. Furnish in largest sizes to minimize joints.
- B. Form Material for Unexposed Concrete: Plywood; 5/8" APA B-B-G-2, exposure 1, exterior, plywood graded per PS-1 standards for construction and industrial plywood. Use plywood thickness sufficient to support concrete at temperature and rate of pour. Use only sound, undamaged sheets with clean, true edges. Lumber shall be standard grade or better.
- C. In lieu of "A" above, the material specified under "B" may be used for exposed concrete if a 3/16" smooth one side, treated, pressed fiberboard liner is utilized.

- D. Lumber for light framing (less than 6" wide): standard grade and species. Framing (6" wider and from 2" to 4" thick): provide No. 1 grade in one of the following species:
1. Douglas Fir (WWPA).
 2. Southern Pine (SPIB).
 3. Redwood (RIS).
- E. Prefabricated steel or metal shall be minimum 16 ga. as approved to produce surfaces equal to those specified for wood. Forms shall be matched, tight fitting, and stiffened to support weight of concrete.
- F. Form Ties: Bolt and rod type so designed that upon removal of the form no metal shall be within 1-1/2" of the concrete surface and no holes larger than 1" in diameter. Concrete exposed to the exterior shall utilize galvanized ties.
- G. Dovetail Anchor Slots: Galvanized steel, foam filled, release tape sealed slots, bond tab anchors as manufactured by Heckmann, Hohmann & Barnard, Inc. or approved.
- H. Form Release Agent: Colorless mineral oil which will not stain the concrete or impair natural bonding characteristics of coating intended for use on concrete.
- I. Formed Construction Joints for Slab-on-Grade: Galvanized steel, tongue and groove type profile with knockout holes to receive doweling, min. 26 gage unless noted otherwise. Size and profile as indicated on drawings or as required to fit field conditions.
- J. Slab Edge Joint Filler: ASTM D994, premolded asphaltic board, thickness as indicated or (if not indicated, 1/2" thick minimum).
- K. Vapor Barrier: Conforming to ASTM E1745 Class A, non-woven, .01 permeance, not less than 15 mils thick.
1. Acceptable Manufacturers:
 - a. Stego wrap 15 mil vapor barrier by Stego Industries.
 - b. WR Meadows pre-molded membrane with plasmatic core.
 - c. Zero-perm by Alumiseal.
 - d. Vaporblock VB15 by Raven Industries.

- L. 6 mil thick, clear polyethylene film (for bond break between walls and floor), type recommended for below grade application.
 - M. Nails, spikes, lag bolts, through bolts, anchorages: Size as required, of sufficient strength and character to maintain formwork in place while placing concrete.
- 2.02 REINFORCEMENT MATERIALS
- A. Reinforcing Bars: ASTM A 615 Grade 60 deformed.
 - B. Welded Wire Fabric: ASTM A 185, welded steel wire fabric.
 - C. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire bar-type supports complying with CRSI specifications.
 - 1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
 - 2. For exposed-to-view concrete surfaces where lags of supports are in contact with forms, provide supports with legs that are protected by plastic (CRSI, Class 1) or stainless steel (CRSI, Class 2).
- 2.03 CONCRETE MATERIALS
- A. Cement; controlling specification for Portland Cement, ASTM C150, Type I-Normal or Type II.
 - B. Aggregates shall conform to ASTM C-33. Maximum size of aggregate shall not be larger than 1/5 of narrowest dimension between forms of member for which concrete is to be used, nor larger than 3/4 of minimum clear spacing between reinforcing bars, nor larger than 1/3 of slab depth.
 - C. Lightweight aggregates shall conform to ASTM C 330.
 - D. Water: Clean and potable.
 - E. Air Entrainment Admixture: ASTM C260, as manufactured by Master Builders, Euclid, or W.R. Grace.

- F. Chemical Admixtures: ASTM C494; Type 'A' - water reducing; Type 'B' - retarding, Type 'C' - accelerating, Type 'D' - water reducing and regarding, Type 'E' - water reducing and accelerating, Type 'F' - water reducing high range; Type 'G' - water reducing high range and retarding. Calcium chloride or admixtures containing more than .05 percent chloride ions by weight of admixture shall not be used. Each admixture shall not contribute more than 5 ppm by weight, of chloride ions to the total concrete constituent. Use admixtures in strict compliance with manufacturer's directions.
- G. Bonding Agent: Polymer resin emulsion, W.R. Grace or reviewed/approved equal.
- H. Non-Shrink Grout: Non-shrink type, pre-mixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents. Capable of developing a minimum compressive strength of 7000 psi at 28 days.
- I. Adhesive Anchoring: Injectable adhesive or self-contained capsule as manufactured by:
 - 1. 'Hilti' HIT System, or Architect approved/reviewed equal.

2.04 CURING COMPOUNDS & SEALERS

- A. Curing Compound/Sealer: Liquid curing compound, water base, concrete curing-sealing compound, VOC (volatile organic content) compliant, containing fugitive dye that does not leave residue (resin, varnish, wax, etc.). Fugitive dye must disappear in 7 days, as manufactured by:
 - 1. Sonneborn Building Products, Kure-N-Seal W.
 - 2. Dayton Superior Corporation, Safe Cure & Seal (J-18).
 - 3. Burke by EDOCO Spartan-Cote WB Cure Seal Hardener.
 - 4. MasterKure 100W, Master Builders, Inc.
 - 5. Vocomp-20, W.R. Meadows.
- B. Absorptive Mats: Burlap cloth, commercial quality suitable for purpose. Constructed of jute or kenaf, weighing approximately 9 oz. per square yard, complying with AASHTO M182, Class 2.

- C. Moisture retaining cover, complying with ASTM C171; one of the following: waterproof paper, polyethylene film, or polyethylene coated burlap.
 - D. Crack Repair Material: Floor slabs - 2 part, 100% solid epoxy adhesive in formulation recommended by manufacturer for application, as manufactured by:
 - 1. W.R. Meadows Reziweld 1000 or Architect approved/reviewed equal.
 - E. Cure/Sealer Interior Exposed Concrete Floors: Curing compound, non-residual or dissipating resin curing compound. Product of sealer manufacturer and meeting sealer manufacturer's requirements. Manufacturers to include:
 - 1. Dayton Superior Corp "Day-Chem Sil-Cure" (J-13).
 - 2. L & M Cure or Cure R.
- 2.05 CONCRETE MIX
- A. Mix concrete in accordance with ACI 304 and deliver concrete in accordance with ASTM C94.
 - B. Quality working stresses for the design of this project shall be based on specific minimum 28-day compressive strength of concrete or on specified minimum compressive strength at earlier age at which concrete may be expected to receive full load. Provide concrete of the following properties:
 - 1. All concrete - 3500 psi. 28-day compressive strength; water-cement ratio, 0.51 maximum (non-air-entrained). 4000 psi. 28-day compressive strength; water-cement ratio, 0.44 maximum (non-air entrained).
 - C. Slump Limits: Proportion and design mixes to result in concrete slump at the point of placement as follows:
 - 1. All Concrete: Not less than 1" & not more than 4".
 - 2. Concrete containing high-range water-reducing admixture (superplasticizer). Not more than 8 inches after adding admixture to site-verified 2-3 inch slump concrete.
 - 3. Site added water to increase slump is strictly prohibited.

- D. Proportions of aggregate to cement shall be such as to produce a mixture which will work readily into corners, angles of forms, and around reinforcement without permitting materials to segregate. Excess free water shall not collect on concrete surface.
- E. Select admixture proportions for normal weight concrete in accordance with ACI 301, Method 1 and in strict accordance with manufacturer's instructions.
- F. Adjustment to concrete mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather or other circumstances warrant, as accepted by the Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in work.

PART 3. EXECUTION

3.01 FORMWORK ERECTION

- A. Erect formwork, shoring and bracing to achieve design requirements. Fabricate forms for easy removal without hammering or prying against exposed concrete surfaces.
- B. Provide bracing to ensure stability of formwork.
- C. Apply form release agent to formwork in accordance with manufacturer's instructions, prior to placing for accessories and reinforcement.
- D. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings which are affected by agent.
- E. Clean forms as erection proceeds, to remove foreign matter.
- F. Footings and foundations shall be formed, notched and/or sleeved as indicated to provide for installation of mechanical or plumbing piping.
- G. Forms shall conform to shape, lines and dimensions of members as called for, substantially and sufficiently tight to prevent leakage of concrete.

- H. Forms shall be properly braced, and tied together so as to maintain position and shape. Forms for exposed concrete shall be braced so as to provide dimensions called for, and have taped joints.
 - I. Construction joints, whether indicated on drawings or not, shall be made or located so as to least impair strength of the structure. Where joint is to be made, the surface of the concrete shall be thoroughly cleaned and all latency removed. In addition, vertical joints shall be keyed.
- 3.02 INSERTS, EMBEDDED COMPONENTS, AND OPENINGS
- A. Provide formed openings where required for work to be embedded in and passing through concrete members.
 - B. Coordinate work of other Sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors and other inserts.
 - C. Install concrete accessories straight, level, and plumb.
- 3.03 REINFORCEMENT PLACEMENT
- A. Place reinforcement, supported and secured against displacement.
 - B. Ensure reinforcing is clean, free of loose scale, dirt, or other foreign coatings.
 - C. Provide for continuity of reinforcing around corners in footings and walls. Lap corner bars 30 bar diameters.
 - D. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.
- 3.04 PLACING CONCRETE
- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent. Apply bonding agent in accordance with manufacturer's instructions.

- B. Install vapor barrier under interior slab-on-grade.
 - 1. Installation shall be in accordance with manufacturer's instructions and ASTM E164 3-98.
 - a. Unroll vapor barrier with the longest dimension parallel with the direction of the pour.
 - b. Lap vapor barrier over footings and seal to foundation walls.
 - c. Overlap joints 6 inches and seal with manufacturers tape.
 - d. Seal all penetrations (including pipes) per manufacturers instruction.
 - e. No penetration of the vapor barrier is allowed except for reinforcing steel and permanent utilities.
 - f. Repair damaged areas by cutting patches of vapor barrier material overlapping the damaged area 6 inches and taping all four sides with tape.
- C. At interior slabs-on-grade locations, provide bond break from vertical surfaces consisting of 6 mil polyethylene film or 15# asphalt building paper and where indicated on plans.
- D. Place concrete continuously between predetermined control and construction joints. Do not break or interrupt successive pours such that cold joints occur. Where applicable, construction joints shall occur at control joint locations, unless noted otherwise.
- E. Concrete slabs on grade shall be constructed of thickness indicated. If thickness is not indicated, provide a minimum thickness of 4". Minimum thickness at pipes embedded in concrete shall not be less than three times o.d. of the pipe. All buried piping shall have been tested before placement of concrete.
- F. Provide interior control joints where called for on drawing as detailed. When interior construction joints occur, they shall also be considered as control joints. Provide sawed groove similar to a control joint at all construction joints.
- G. Concrete shall be conveyed from the mixer to place of final deposit by methods which will prevent separation and loss of material.

- H. All equipment used for transporting equipment shall be cleaned of all debris. Ice shall be removed from all places to be occupied by concrete forms, and masonry fillers shall be thoroughly wetted except where air temperatures are below 40 degrees F.
- I. Equipment for chuting, pumping, pneumatically conveying concrete, shall be such size and design as to insure practically continuous flow of concrete at delivery and without separation of materials.
- J. Concrete shall be deposited as soon as practicable in its final position to avoid segregation due to re-handling, flowing. Concreting shall be carried on at such rate that concrete is at all times plastic and flow readily into space between bars. No concrete that has partially hardened or has been contaminated by foreign materials shall be deposited on work, nor shall re-tempered concrete be used.
- K. Concreting, once started, shall be carried on as a continuous operation until placing of panel or section is completed. Top surface shall be generally level.
- L. All concrete shall be thoroughly compacted by suitable means during operation of placing and shall be thoroughly worked around reinforcement, embedded fixtures, and into corners of forms. Vibrator shall not be used to flow concrete.
- M. Place floor slabs in checkerboard or saw cut pattern indicated on drawings for design of construction and control joints. In all cases, spacing of control joints shall not exceed areas of 1,000 s.f.
- N. Where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack with non-shrink grout or chemical adhesive. Follow manufacturer's recommendations for installation.
- O. Screed floors slabs-on-grade and concrete base for toppings level, maintaining surface flatness of maximum 1/8 inch in 10 ft.

- P. Protecting and sealing: Protect concrete slabs, etc., from pedestrian traffic for three days after pouring. Concrete shall be cured using two layers of burlap kept wet for minimum of 5 days; or at Contractor's option, he may use sprayed-on compound according to manufacturer's recommendations as approved by Architect. Curing method used shall not discolor original color of concrete, nor shall white liquid curing compound be used.
- Q. Provide concrete pads, bases, foundations, etc., as indicated and/or required by mechanical, electrical or other equipment supplier. Set anchor bolts for machine and equipment to templates or measurements provided.

3.05 FORM REMOVAL

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
- B. Remove formwork progressively and in accordance with code requirements.

3.06 FLOOR FINISHING

- A. Finish concrete floor surfaces in accordance with ACI 301 and ACI 302.
- B. Uniformly spread, screed, and float concrete.
- C. Wood float surfaces which will receive ceramic tile with full bed setting system.
- D. Steel trowel and light broom finish surfaces which will receive thin set ceramic tile.
- E. Maintain surface flatness, with maximum variation of 1/8 inch in 10 ft. Corridor slabs to have overall FF=40, local FF=20.
- F. In areas with a floor drain, maintain floor level at walls and pitch surfaces uniformly to drains.
- G. Floor shall be finished without excessive floating. Delay troweling until concrete is sufficiently hard to prevent water working to surface. Bring finish to smooth level surface with minimum troweling possible.

- H. Finishes, other than floors, exposed on exterior or interior shall be formed true, free from marks, irregularities. Remove any loose material, grind all projections, fill any honeycombing or holes, finish smooth. Use carborundum stone to hand rub and provide smooth, even surface where directed.
- I. Thoroughly clean and prepare concrete floors scheduled to receive a sealer. Apply in strict accordance with manufacturer's instructions.

3.07 CURING

- A. Place absorptive matting and dampen as required.
- B. Immediately after placement, protect concrete from premature drying.
- C. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- D. Provisions shall be made for maintaining concrete in moist condition for at least (5) five days after placement, except high early concrete which shall be cured for at least 2 days.
- E. Cold Weather Requirements:
 - 1. General: Except as modified herein, all work shall be in accordance with ACI 306R.
 - 2. Adequate equipment shall be provided for heating concrete materials and protecting concrete during freezing or near freezing weather. No frozen materials or materials containing ice shall be used.
 - 3. All concrete materials, all reinforcement, forms, fillers, ground with which concrete is to come in contact shall be free from frost. Whenever temperature of surrounding air is below 40° F., all concrete placed in forms shall have a temperature of between 70° F., 80°F. Adequate means shall be provided for maintaining temperature of not less than 70° F. for 3 days, 50° F. for 5 days, except high-early concrete shall have temperature maintained at not less than 70° F. for 2 days, 50° F. for 3 days, or for as much more time as necessary to insure proper curing. Housing, covering, other protection used in connection with curing shall

remain in place at least 24 hours after artificial heating is discontinued. No dependence shall be placed on salt or other chemicals for prevention of freezing.

F. Weather Conditions:

1. In hot weather, sprinkle and cover all concrete for at least 24 hours longer than specified for normal curing periods. In hot weather work shall be in accordance with ACI 305R.
2. In weather when temperature falls below freezing, and in any event between December 1 and April 1, no concrete shall be poured without adequate frost protection.

3.08 CONCRETE FINISHING

- A. Provide concrete surfaces to be left exposed, concrete walls, columns, etc., with smooth rubbed finish not later than one day after form removal.
 1. Moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

3.09 FIELD QUALITY CONTROL

- A. Inspection and testing shall be performed by an independent firm selected by the Owner and retained by the Contractor, in accordance with Division 1, Section 01400 "Quality Control".
- B. The Contractor shall notify the Architect/Engineer and the Testing Lab at least (5) five days prior to the commencement of concrete operations.
- C. See Division 1 for inspection and testing allowances, Section 01400 "Quality Control".
- D. Specimens shall be molded and cured as per ASTM C31. Three specimens per test, not less than one test for each day's pour, each 50 yards concrete poured, each building unit, or each strength concrete. Specimens shall be laboratory cured.

- E. Specimens shall be tested in accordance with ASTM C39. One specimen shall be tested at 7 days, two at 28 days.
- F. When average strength of laboratory control cylinders fall below required compressive strength, Architect shall have right to order change in proportions and water content for remainder of structure. Architect shall have right to require tests as per ACI Building Code; Chapter 20 where load tests show concrete does not conform with drawings or specifications. Deficiency shall be corrected without additional cost to Owner.
- G. Four copies of test reports at (7) days and (28) days, shall be sent directly to the Architect by the Testing Laboratory, with all required information shown.
- H. Slump tests per ASTM C-172 and C-143, minimum of one test for each set of cylinders, or more as conditions warrant. Deliveries exceeding specified slump shall be rejected.

3.10 DEFECTIVE CONCRETE

- A. Modify or replace concrete not conforming to required lines, details and elevations, as directed by the Architect/Engineer.
- B. Failure of concrete topping to bond to substrate (as evidenced by a hollow sound when tapped), or disintegration or other failure of topping to perform as a floor finish, will be considered failure of materials and workmanship. Repair or replace toppings in areas of such failures, as directed.

END OF SECTION 03001

SECTION 04100 - MORTAR & GROUT

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this specification. Refer to Structural Drawings for additional information.

1.02 SECTION INCLUDES

- A. Work included in this section consists of furnishing all labor, materials, equipment, and incidentals required for complete installation of mortar and grout for masonry.
- B. Related work specified elsewhere:
 - 1. Section 03001 Concrete (Non-shrink grout).

1.03 ENVIRONMENTAL REQUIREMENTS

- A. Recommended Practices for Hot and Cold Weather Masonry Construction as published by the Masonry Industry Council.

PART 2. PRODUCTS

2.01 MATERIALS

- A. Portland Cement: ASTM C150, Type 1 provide natural color or white cement as required to provide mortar color indicated.
- B. Mortar Aggregate: ASTM C144, standard masonry type.
- C. Hydrated Lime: ASTM C207, Type 'S', or 'N'.
- D. Masonry Cement: ASTM C91.
- E. Premix Mortar: ASTM C387.
- F. Grout Aggregate: ASTM C404.
- G. Grout Fine Aggregate: ASTM C144, 100% passing #8 sieve, maximum 5-30% passing #50 sieve.
- H. Water: Clean and potable.

- I. Integral water repellent additive meeting ASTM E-514.
 - J. Plasticizer:
 - 1. SIKA Chemical Corporation "Intraplast Z".
 - 2. Euclid Chemical Co. "Eucon BK-S".
 - K. Storage of all material shall prevent the intrusion of foreign matter. Store all masonry units on the ground, protected against damage and intrusion of excess moisture. No damaged or deteriorated materials shall be used.
- 2.02 MORTAR MIXES
- A. Mortar for exterior load bearing walls: ASTM270 Type "M" or "S" and all exterior masonry work below grade; ASTM C270, Type "S", using the property method above grade unless noted otherwise on drawings. Use ASTM C270 Type 'N' above grade at veneers.
 - B. Mortar for interior non-load bearing walls and partitions: ASTM C270, Type 'S', using the property method.
 - C. Mortar for reinforced masonry ASTM C270, Type 'S', using the property method.
 - D. Pointing mortar for masonry veneers ASTM C270, Type 'N', using the property method.
 - E. Ready-Mixed Mortar: Cementitious materials, water, and aggregate complying with requirements specified in this Article; combined with set-controlling admixtures to produce a ready-mixed mortar complying with ASTM C 1142.
 - F. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494, Type C, and recommended by the manufacturer for use in masonry mortar of composition indicated.
- 2.03 MORTAR MIXING
- A. Thoroughly mix mortar ingredients in approved type mixing machine in quantities needed for immediate use in accordance with ASTM C270 or C780. Discharge mixer completely before recharging.
 - B. All exterior above grade mortar exposed to moisture shall be fabricated with integral water repellent additive.

- C. Blend admixtures in accordance with manufacturer's instructions.
 - D. Do not use anti-freeze compounds to lower the freezing point of mortar.
- 2.04 GROUT MIXES

- A. Bond beams, lintels, engineered masonry, reinforced masonry walls: min. 3000 psi strength at 28 days unless noted otherwise; 8-10 inches slump; pre-mixed grout in accordance with ASTM C94, or batch mixed in accordance with ASTM C476 for fine or course grout.

PART 3. EXECUTION

3.01 EXAMINATION AND PREPARATION

- A. Apply bonding agent to existing concrete surfaces.

3.02 INSTALLATION

- A. Install pre-mix mortar and grout in accordance with manufacturer's instructions.
- B. Work grout into masonry cores and cavities to eliminate voids. Do not displace reinforcement. Reinforcing shall be mechanically anchored in masonry cores to prevent displacement during grouting.

END OF SECTION 04100

SECTION 04300 - UNIT MASONRY

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this specification.

1.02 SECTION INCLUDES

- A. Work included in this section consists of furnishing all labor, materials, equipment and incidentals required for complete installation of concrete masonry and brick units including installation of reinforcement, anchorage and accessories.
- B. Related work specified elsewhere:
 - 1. Section 04100 - Mortar & grout
 - 2. Section 05120 - Structural Steel Framing: Grout associated with steel base; bearing and leveling plates.

1.03 PERFORMANCE REQUIREMENTS

- A. Provide unit masonry that develops the following installed compressive strengths (f'm) at 28 days.
 - 1. For concrete Unit Masonry: As follows, based on net area:
 - a. For 8" CMU: f'm = 1500 psi
 - b. For 12 inch CMU: f'm = 1500 psi

1.04 SUBMITTALS

- A. Provide data on concrete masonry units including proposed reinforcing.
- B. Reinforcing steel shop drawings (refer to drawings for additional information)
- C. If specifically requested by the Architect/Engineer, provide samples for verification as follows:

1. Full-size units for each different exposed masonry unit required showing the full range of exposed colors, textures, and dimensions to be expected in the completed construction.
2. Accessories embedded in the masonry.

1.05 QUALITY ASSURANCE

- A. Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire resistance ratings determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by another means, as acceptable to authorities having jurisdiction.
- B. Single-Source Responsibility for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one source and by a single manufacturer for each different product required.
- C. Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Hot and Cold weather requirements: Recommended Practices for Hot or Cold Weather Masonry Construction as published by the Masonry Industry Council.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not install until they are in an air-dried condition.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

- D. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

PART 2. PRODUCTS

2.01 CONCRETE MASONRY UNITS

- A. Concrete block (CMU): ASTM C90, medium weight (105-125 pcf). Use for above and below grade, exterior or interior wall applications. Provide units made with "dry block" as manufactured by W.R. Grace & Company (or approved) for exterior wall applications. This includes exterior walls with veneers.
- B. Texture of exposed faces of block shall be uniform for all block used in this project. Solid units may be used for bearing under structural members. No units with exposed chipped surfaces will be permitted in areas where exposed.
- C. Provide shapes such as special units at pilaster blocks, column block enclosures, bullnose all external corners, sash recesses, square ends, lintel blocks and other, as required by drawings or specifications.

2.02 BRICK UNITS

- A. Face Brick: Salvage existing brick for reuse. Return any unused salvaged brick to Owner at end of job.

2.03 REINFORCEMENT AND ANCHORAGE

- A. All single wythe joint reinforcement shall be ladder type wire reinforcing consisting of No. 9 gauge deformed side rods, with No. 9 gauge standard ladder type cross rods. All rods shall be hot dip galvanized using ASTM A153, Class B-2 standards. Out to out spacing of side rods shall be approximately 2" less than the nominal wall thickness. Provide pre-fabricated corners and tee units as required.
- B. All multiple wythe/cavity wall joint reinforcement shall be adjustable ladder type hot dip galvanized in accordance with ASTM A153, Class B-2 standards. Separate adjustable ties extend to engage outer wythe by at least 2" and spaced not more than 16" o.c.
 - 1. Use where horizontal joints of facing wythe do not align with those of back-up and where indicated.

2. Use where facing wythe is of different material than back-up wythe.
- C. For anchorage to steel framing, provide manufacturer's standard anchors with crimped 1/4 inch (6.4 mm) diameter wire anchor section for welding to steel and triangular-shaped wire tie section sized to extend within 1 inch (25 mm) of masonry face and wire diameter of 0.25". Provide one tie on each side of framing where masonry abuts. Ties to be spaced at 16" o.c. vertical.
- D. Adjustable Steel Wire Wall Ties (For Veneer w/CMU Backup): Formed wire 3/16" diameter high tensile, cold drawn steel wire conforming to ASTM A82, galvanized zinc coated finish, installed at 16" o.c. vertical opposite ladder reinforcing. Provide one tie per 2.66 square feet of wall area minimum.
- E. Manufacturers:
 1. AA Wire Products Co.
 2. Dur-O-Wal.
 3. National Wire.
 4. Hohmann and Barnard, Inc.
 5. Wire Bond.
 6. Other Architect Approved.
- F. Reinforcing Steel: ASTM A615, 60-ksi-yield grade deformed steel bars unprotected finish.

2.04 ACCESSORIES

- A. Building Paper: 15# asphalt saturated felt.
- B. Column Wrap: Waxed corrugated cardboard of 15# asphalt saturated felt.

2.05 LINTELS

- A. Lintels shall be steel, precast or cast-in-place in accordance with details as shown or scheduled on the drawings.

PART 3. EXECUTION

3.01 EXAMINATION AND PREPARATION

- A. Verify that field conditions are acceptable and ready to receive work. Examine rough-in and built-in construction to verify locations prior to installation.
- B. Coordinate placement of anchors supplied to other sections.
- C. Employ skilled mechanics, experienced supervision. Lay masonry plumb, true to line, with level, accurately spaced courses. Break vertical joints unless otherwise indicated. Keep bond plumb. Rack courses, where necessary, without toothing. Lay out facing before setting, minimize cutting closures, jumping bond.
- D. Do not wet concrete masonry. Lay masonry with complete bearing in full beds of mortar. Butter sides for full vertical joints. Shove units into place. Anchor walls not otherwise bonded with ties every 8", every four (4) courses.

3.02 COURSING

- A. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness. Lay out walls in advance for accurate spacing of openings, movement type joints, returns, etc. Avoid units of less than half size at corners and jambs.
- B. Block unit shall be laid in a running bond, as indicated on drawings with vertical joints aligned plumb, horizontal joints level. Joints in back-up work shall be worked out to provide bonding with facing masonry. Joints shall be uniform in width, thickness not to exceed 1/3". Exposed joints in finish work shall be tooled slightly concave, others shall be cut flush.
- C. Salvaged Brick Units: Lay in running, bond unless noted otherwise on drawings. Course as detailed on drawings. Form concave mortar joints as detailed.

- D. Initial block course (first course above foundation) in walls (interior or exterior) shall be laid in full mortar beds on shells and cross webs; in other locations, units shall be laid in full mortar beds on shells only. Solid block units shall be laid same as brick. Vertical joints between units shall be filled with mortar between shell ends.
- E. All non-bearing walls and partitions shall terminate against beam soffits, roof, or structural ceilings, unless otherwise shown on drawings, or as stated below. Build wall to within 3/8" of overhead structure on roof, fill top joint and all voids with non-combustible insulation board which has width of 1" less than wall, then caulk joints.
- F. Both bearing and non-bearing masonry walls which enclose corridors, storage or mechanical rooms, shops and other rooms requiring a rated separation from adjacent areas, must have the top joint as well as all voids at roof deck and elsewhere in or over these walls, filled with cement grout, mortar, or plaster bed of at least 2" in width. Where no ceilings occur in the room, said fill shall be troweled flush with the wall surface or surfaces on the exposed side of the wall.
- G. All interior and exterior block walls shall have control joints 20'-0" o.c. maximum for exterior and 25'-0" to 30'-0" at interior walls. Line up control joints with joints in foundation wall and joints in face brick. Leave exposed faces on joints ready for caulking. Provide vertical reinforcing in grouted core on each side of exterior masonry control joints. Reinforcing to match vertical wall steel.
- H. Bond each course at corners and break vertical joints at least 2". Tee shaped or cross shaped intersecting walls shall have vertical continuous joint. These joints shall be caulked. Provide for continuity of joint reinforcing by providing pre-fabricated "T" shaped or "L" shaped units.
- I. Provide welded steel masonry reinforcing placed in every second horizontal course in all block walls with at least one layer below a window sill level and one layer above a lintel level. Lay reinforcing on wall and cover with mortar, bed unit as usual. Longitudinal wire shall be

lapped not less than 32 diameters at splices. At corners, cut inside rod and bend to proper angle.

- J. Construct bond beams as indicated with concrete grout. Maintain accurate location of reinforcing steel during grout placement.
- K. Grout course solid (or use solid units) immediately below veneer, where masonry serves as support for the veneer (i.e. brick ledges).
- L. Grout course solid (or use solid units) immediately below door openings or other locations where masonry serves as a support for a sill.
- M. Stopping and Resuming Work: In each course, rack back 1/2-unit length for one-half running bond or 1/3-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry and remove loose masonry units and mortar prior to laying fresh masonry.

3.03 PLACING AND BONDING

- A. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.
- B. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with fire rated compressible joint filler.

3.04 REINFORCEMENT & ANCHORAGES - SINGLE WYTHE MASONRY

- A. Walls laid up with concrete block, including where used as back-up shall be reinforced with horizontal steel wall reinforcing as specified. Reinforcing shall be of proper width for block wythe, to have side wires over block shells. Place joint reinforcement at 16" o.c. vertical and continuous in first and second joint below top of walls.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum of 3'-0" beyond each side of opening.
- C. Reinforcing in foundation walls (below floor slab) shall be placed every other course, continuous.

- D. Terminate reinforcing each side of control joints; lap end joints 12", form corners by cutting and lapping inside wire, bending outside wire; form intersections by cutting and lapping reinforcing from one wall with other wall. Bed side wires completely in mortar.

3.05 LINTELS

- A. Install loose steel lintels over door openings and other miscellaneous openings as indicated on the structural plans.
- B. Construct concrete block lintels over door openings and other openings as indicated on the structural plans or otherwise required.
- C. Maintain minimum bearing each side of opening of 8" or as specified on structural drawings. Align end of lintel with vertical block joints.

3.06 GROUTED COMPONENTS

- A. Reinforce bond beams and pilasters as detailed.
- B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.
- C. Place and consolidate grout fill without displacing reinforcing.
- D. At beam bearing locations, fill masonry cores with grout for a minimum 12 inches either side of member and three courses vertical, unless otherwise noted.

3.07 GROUTED COMPONENTS

- A. Reinforce bond beams as detailed.
- B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.
- C. Place and consolidate grout fill without displacing reinforcing.
- D. At beam bearing locations, fill masonry cores with grout for a minimum 12 inches either side of member and three courses vertical, unless otherwise noted.

3.08 ENGINEERED MASONRY

- A. Lay masonry units with core cells vertically aligned and cavities between wythes clear of mortar and unobstructed.
- B. Reinforce masonry unit cores and cavities with reinforcement bars and grout as indicated. Provide vertical bars in corners. Provide vertical bars at each side of all masonry openings. Vertical bars to continue at noted spacing above openings.
- C. Secure vertical reinforcement in position at top and bottom of cells and at intervals not exceeding 192 bar diameters. Splice reinforcement 48 bar diameters, minimum 12".
- D. Place mortar in masonry unit bed joints back 1/4 inch from edge of unit grout spaces; bevel back and upward. Permit mortar to cure 3 days before placing grout.
- E. Grout spaces less than 2 inches in width with fine grout using low lift grouting techniques. Grout spaces 2 inches or greater in width with coarse grout using high or low lift grouting techniques.
- F. When grouting is stopped for more than one hour, terminate grout 1-1/2 inch below top of upper masonry unit to form a positive key for subsequent grout placement.
- G. Low Lift Grouting: Place first lift of grout to a height of 60 inches maximum and consolidate by mechanical vibration. Place subsequent lifts in maximum 60 inch increments and vibrate grout for consolidation. Ensure mortar has gained sufficient strength to withstand pressure prior to grouting. "Puddling" may be used in lieu of mechanical vibration if grout lifts are limited to 12 inches maximum.
- H. High Lift Grouting:
 - 1. Provide cleanout opening no less than 4 inches high at the bottom of each cell to be grouted by cutting one face shell of masonry unit.
 - 2. Clean out masonry cells and cavities with high-pressure water spray. Permit complete water drainage. Cells and cavities may be "cleaned" by using steel rod to remove excess mortar protrusions.

3. Request that Architect/Engineer inspect the cells. Allow three days advance notice.
4. After cleaning and cell inspection, seal openings with masonry units.
5. Pump grout into spaces. Maintain water content in grout to intended slump without aggregate segregation.
6. Limit grout lift to 60 inches and mechanically vibrate for grout consolidation. Wait 30 to 60 minutes before placing next lift.

3.09 CONTROL AND EXPANSION JOINTS

- A. Do not extend horizontal joint reinforcement through control and expansion joints.
- B. Form control joint with a sheet building paper bond breaker fitted to one side of the hollow contour end of the masonry unit. Fill the resultant elliptical core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.
- C. Form expansion joints as detailed.

3.10 BUILT-IN WORK

- A. As work progresses, build in hollow metal door frames, fabricated metal frames, wood nailing strips, anchor bolts, plates, and other items to be built in the Work furnished by other Sections.
- B. Bed anchors of hollow metal door frames in adjacent mortar joints. Fill frame voids solid with grout. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.

3.11 POINTING AND CLEANING

- A. Point up all exposed existing brick where required, fill all holes and joints; remove loose mortar, cut out defective joints, and repoint where necessary.

3.12 TOLERANCES

- A. Maximum Variation from Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Variation from Level Coursing: 1/8 inch in 3 ft. and 1/4 inch in 10 ft.; 1/2 inch in 30 ft.

3.13 CUTTING AND FITTING

- A. Cut and fit for chases, pipes, conduit, sleeves, grounds, and other items. Coordinate with other Sections of Work to provide correct size, shape, and location.
- B. Form slots, grooves, chases, recesses, other items required for other trades. Build in all required structural steel, miscellaneous metal, sash anchors, precast concrete anchors, and other items. Bed in mortar to line and level. Build in counter flashing furnished by Roofing Contractor. Check all requirements in advance to eliminate cutting.
- C. Do necessary cutting of masonry for installation of items not otherwise provided for. Patch walls, maintain structural stability, appearance, weather resistance.
- D. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full-size units without cutting, where possible. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

3.14 REPAIRING, POINTING AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units; install in fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point-up joints, including corners, opening, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for application of sealants.
- C. Remove excess mortar and mortar smears.
- D. Clean soiled surfaces with cleaning solution.

- E. On completion of pointing and re-pointing of interior face brick and block work, clean thoroughly with "Sure Klean 600", "Craft Klean" or similar prepared detergent, acceptable to brick and/or block manufacturer, applied strictly according to the manufacturer's instructions with stiff fiber brushes. Drench with clean water immediately after cleaning. Do not use job mixed acid on this project. All cleaning shall be done prior to installation of any finished floor, wall mounted light fixtures, aluminum frames or items subject to damage. Protect aluminum and hollow metal frames, other built-in items.

3.15 MASONRY WASTE DISPOSAL

- A. Recycling: Undamaged, excess masonry materials (except salvaged brick) are Contractor's property and shall be removed from the Project site for his use.

END OF SECTION 04300

SECTION 05120 - STRUCTURAL STEEL

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this specification.

1.02 SECTION INCLUDES

- A. Work included in this section consists of furnishing all labor, materials, equipment and incidentals required for complete installation of structural steel framing members, accessories and assemblies scheduled on the drawings and/or herein.
- B. Furnishing, erection and removal of temporary bracing and erection material for complete job safety.
- C. Items to be furnished under this Section include loose lintels for setting by others.
- D. Related work specified elsewhere:
 - 1. Section 03001 Concrete - placement of anchors for casting into concrete.
 - 2. Section 04300 Unit Masonry Work - placement of anchors for embedding into masonry.

1.03 SUBMITTALS

- A. Shop Drawing: Indicate sizes, spacing, dimensions and locations of structural members, openings, connections, cambers, loads and welded connections.
- B. Structural Performance: Engineer structural steel connections required by the Contract Documents to be selected or completed by the fabricator to withstand design loadings indicated.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed structural steel work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Fabricator Qualifications: Engage a firm experienced in fabricating structural steel similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to fabricate structural steel without delaying the Work.
- C. Fabricate structural steel members in accordance with AISC-Specification for the design, fabrication and erection of structural steel for buildings.
- D. "Code of Standard Practice for Steel Buildings and Bridges" adopted by the American Institute of Steel Construction, AISC.
- E. "Code for Welding in Building Construction", of American Welding Society AWS D1.1. The term, Building Commissioner, as used in this code shall mean Authorized Engineer. Use AWS certified welders for welding processes involved.
- F. "Specification for Structural Joints Using ASTM A325 Bolts or A490 Bolts", approved by Research Council on Structural Connections (RCSC).
- G. Surface preparation and paint application specifications of the Steel Structures Painting Council (SSPC).
- H. Standard specification of the American Society of Testing Materials (ASTM), as designated herein.
- I. Load indicator washer, if used, shall conform to the latest edition of ASTM Specification or high strength bolting, ASTM Designation A-325.
- J. Manufacturer's specifications, directions, instructions, and when referred to, governing regulations furnished by the Architect/Engineer, before any work has begun.

PART 2. PRODUCTS

2.01 MATERIALS

- A. Channels, angles, shades: Plates/Bars/Etc.: ASTM A36, $F_y=36\text{ksi}$.
- B. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.

2.02 FABRICATION

- A. Continuously seal joined members by continuous welds. Grind exposed welds smooth.
- B. Fabricate in accordance with above standards and normal fabrication practice to achieve components capable of being erected into complete, safe, well-constructed structure within minimum tolerances specified. Steel shall be free from scale, pits, rust. Steel shapes other than indicated may be substituted if no change in architectural design is involved; substitutes must develop strength and stiffness of indicated shapes. Architect/Engineer shall not permit use of steel bearing trademarks and names that will remain legible after application of final finish product for exposed work.
- C. Provision for Other Trades: Provide all lugs, clips, connections, bolts, studs, holes, etc., necessary to complete fabrication, erection, and attachment of materials for other trades. Responsibility for providing information relating to such material, holes, shall be provided in time for inclusion on shop drawings by trade involved.
- D. Exposed Steel: Exposed member shall be absolutely straight, with surface smooth, corners, edges sharp, true and free from burrs, other irregularities, overruns, adjacent members perfectly matched. Exposed welds shall be neatly dressed, ground smooth. Exposed steel surfaces shall be free from rolled or stamped heat numbers, manufacturer's names, other identification marks.
- E. Erection Material: Provide all lugs, connections, anchors, shims, filler plates, rods, bolts, etc., necessary for complete erection, for complete job safety.

2.03 FINISH

- A. Shop Paint: Clean surfaces thoroughly according to SSPC-SP2 "Hand Cleaning", if necessary, SSPC-SP3 "Power Tool Cleaning", to remove all rust, scale. Apply one shop coat of paint in accordance with SSPC-15, at manufacturer's recommended rate, brushed or sprayed to achieve 1.5 mil dry film thickness. Painting of exposed steel shall be in strict accordance with manufacturer's printed specifications, methods and recommendations. Do not paint surfaces within 2" of field welds. Take particular care to provide paint film on exposed members that is smooth, even, free from runs, drips, other visual defects.
- B. Shop prime structural steel members. Do not prime surfaces that will be fireproofed or field welded.
- C. On surfaces inaccessible after assembly or erection, apply two coats of primer. Change color of second coat to distinguish it from the first.

PART 3. EXECUTION

3.01 EXAMINATION AND PREPARATION

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Inspection: Prior to commencing work, verify all steel locations, grouting, elevation of leveling and bearing plates, related work set by others, report discrepancies for correction. Field measurements, where required, shall be taken by this trade, who shall be responsible for their accuracy.

3.02 ERECTION

- A. Delivery and Storage: Exercise care in unloading and storage to avoid damage. Dumping to ground shall not be permitted. Material stored at site shall be supported completely free of ground, covered to avoid damage from elements. Members warped or bent shall be unacceptable; and shall be replaced if, in Architect/Engineer's opinion, they are unserviceable or cannot be corrected within fabrication tolerances. Provide proper shakeout area for all steel to prevent damage.

- B. Allow for erection loads. Provide temporary bracing to maintain framing in alignment until completion of erection and installation of permanent bridging and bracing.
- C. Do not field cut or alter structural members without approval of Architect/Engineer.
- D. Erection Procedure: Erect material plumb, level, maintain condition to completion. Take particular care to have work plumb and level before making permanent connections. Tolerance shall be 1 to 500 for interior members; Provide necessary temporary bracing and guying, to align structure properly for permanent connections, to safely resist all erection, dead and wind load. Remove bracing and guys, only after completion of permanent alignment, assembly, and when structure is capable of completely sustaining design and temporary construction loads.
- E. Design connections for reactions noted. If reactions are not noted, connections shall be designed for 50% of the allowable uniform load as noted in the AISC Manuals.
- F. Engineer's approval before leaving job.
- G. Field Painting: Remove temporary guys, bracing, bracing clips and grind flush all burrs remaining before painting. Remove welding slag, spatter, rust, burnt paint and wire brush clean all welds before touch-up. Spot paint all abrasions, field bolts and field welds with same paint used for shop coat.

3.03 FIELD QUALITY CONTROL

- A. Field inspection will be performed under provisions of Division 1, General Requirement.
- B. Correct deficiencies in or remove and replace structural steel that inspections and test reports indicate do not comply with specified requirements.
- C. Additional testing, at contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

END OF SECTION 05120

SECTION 06100 - CARPENTRY

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this Section.

1.02 DESCRIPTION OF WORK:

- A. The extent of the carpentry work is shown on the Drawings.

1.03 QUALITY ASSURANCE:

- A. Lumber Standard: Comply with U.S. Department of Commerce Product Voluntary Standards PS 1-07, "Structural Plywood", PS 2-04 Performance Standard for "Wood based structural use panels" and PS 20-05 American Softwood Lumber Standard, except as otherwise indicated.
- B. Factory mark each piece of lumber and plywood with type, grade, mill, and grading agency: West Coast Lumber Assoc. (WBLC) or Western Wood Products Association (WWPA).

1.04 SUBMITTALS:

- A. Wood Treatment Data:
 - 1. Submit treatment manufacturer's instructions for proper use of each type of treated material.
 - a. Pressure Treatment: For each type specified, include certification by treating plant stating chemicals and process used, net amount of preservative retained, and conformance with applicable standards.
 - b. For water-borne preservatives, include statement that moisture content of treated materials was reduced to a maximum of 15% prior to shipment to project site.
- B. Product Data:
 - 1. Submit manufacturer's specifications and other data for each carpentry anchorage, fastening, and miscellaneous material. Provide material certificates for all lumber and plywood. Transmit a copy of each instruction to the Installer.

1.05 PRODUCT HANDLING:

- A. Delivery and Storage: Keep materials dry during delivery and storage. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber and plywood and provide air circulation within stacks.

1.06 JOB CONDITIONS:

- A. Coordination: Fit carpentry work to other work, scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow proper attachment of other work.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Lumber - General:

- 1. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS 20-05, for the moisture content specified for each use. Use dressed lumber, surfaced four sides (SFS) seasoned with 19% maximum moisture content at time of dressing.

B. Framing Lumber (2" through 4" thick):

- 1. For light framing (less than 6" wide), provide Construction Grade Douglas Fir as graded by the West Coast Lumber Bureau (WCLB) or equivalent species and grade with minimum fiber stress rating (bending) of 1000 psi (Fb), and modulus of elasticity of 1,500,000 psi.
- 2. For structural framing (6" and wider and from 2" to 4" thick) provide dense No. 1 Grade Douglas Fir as graded by the West Coast Lumber Bureau (WCLB) or equivalent species and grade with minimum fiber stress rating (bending) of 1500 psi (Fb), and modulus of elasticity of 1,700,000 psi.

C. Boards (less than 2" thick):

- 1. Produce lumber of 19% maximum moisture content (S-DRY) and of the following species and grade.
 - a. Redwood Construction Common (RIS).
 - b. Southern Pine No. 2 Boards (SPIB).
 - c. Or any species graded construction Boards (WCLB or WWPA).

D. Plywood:

1. Provide only Douglas Fir Plywood in accordance with grading requirements of the APA - The Engineered Wood Association as follows:
 - a. Treated non-combustible AC standard with exterior glue.

E. Anchorage and fastening Materials:

1. Select proper type, size, material, and finish for each application. Comply with the following:
 - a. Nails and Staples: FS FF-N-105.
 - b. Wood Screws: FS FF-S-111.
 - c. Bolts and Studs: FS FF-B-575.
 - d. Nuts: FS FF-N-836.
 - e. Washers: FS FF-W-92.
 - f. Lag Screws or Lag Bolts: FS FF-B-561.
 - g. Masonry Anchoring Devices: For expansion shields, nails, and drive screws, comply with FS FF-S-325.
 - h. Toggle Bolts: FS FF-B-588.
 - i. Bar or Strap Anchors: ASTM A 575 carbon steel bars.

2.02 WOOD TREATMENT:

- A. Preservation Treatment: Where lumber or plywood is indicated as "Treated" or is specified herein to be treated, comply with the applicable requirements of the American Wood Preservers Association (AWPA) AWPA P23-08, ASTM D-1625 and Federal Specification TT-W-50.
- B. Pressure-treat above-ground items with water-borne preservatives complying with AWPA P5-09, ASTM D-1760, and Federal Specification TT-W-571. After treatment, kiln-dry to a maximum moisture content of 19%. Treat indicated items and the following, except where fire retardant treated.

1. Wood cants, nailers, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
3. Wood framing members less than 12 inches above grade excepting timber.

C. Fire Retardant Treated:

1. Wood blocking and similar items installed within the building shall be pressure impregnation with retardant chemicals to achieve a flame spread rating of not more than 25 when tested in accordance with UL Test 723, ASTM E 84, or NFPA Test 355.

PART 3 - EXECUTION

3.01 INSPECTION:

- A. Installer must examine the substrates and supporting structure and the conditions under which the carpentry work is to be installed and notify the General Contractor, in writing, of conditions detrimental to the work. Do not proceed with the installation until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

3.02 INSTALLATION:

A. General:

1. Discard units of material with defects which might impair the quality of the work, and units which are too small to fabricate the work with minimum joints or the optimum joint arrangement.
2. Set carpentry work accurately to required levels and lines, with members plumb and true and accurately cut and fitted.
3. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required. Provide washers under bolt heads and nuts in contact with wood. Nail plywood in accordance with the recommendations of APA-The Engineered Wood Association.

4. Use common wire nails, except as otherwise shown or specified herein. Use finishing nails for exposed work. Do not wax or lubricate fasteners that depend on friction for holding power. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; pre-drill as required. Do not drive threaded friction type fasteners; turn into place. Tighten bolts and lag screws at installation and retighten as required for tight connections prior to closing in or at completion of work.

B. Wood Grounds, Nailers, Blocking and Sleepers:

1. Provide wherever shown and where required for screening or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.
2. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise shown. Build into masonry during installation of masonry work. Where possible, anchor to form work before concrete placement.
3. Provide permanent grounds of dressed, pressure preservative treated key-bevelled lumber not less than 1-1/2" wide and of the thickness required to bring face of ground to exact thickness of finished material involved. Remove temporary grounds when no longer required.

C. Wood Furring:

1. Install plumb and level with closure strips at all edges and openings. Shim with wood as required for tolerance of finished work.

D. Wood Framing:

1. Provide framing members of sizes and on spacings shown and frame openings as shown, or if not shown, comply with recommendations of "The Wood Frame Construction Manual" 2001 Ed. of the American Wood Council. Do not splice structural members between supports.

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2. Anchor and nail as shown, and comply with the
"Recommended Nailing Schedule - Table I of the Manual
for Housing Framing: and other recommendations of the
N.F.P.A.

E. Installation of Plywood:

1. Comply with recommendations of the Engineered Wood
Association (APA) for the installation of plywood.

END OF SECTION 06100

SECTION 06402 - INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Custom plastic laminate cabinetry.
 - 2. Hardware schedule for new custom cabinets.
- B. Related Sections: The following sections contain requirements that relate to this section:
 - 1. Division 6 Section 06100 "Carpentry" for furring, blocking, and other carpentry work that is not exposed to view.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each type of product and process specified in this section and incorporated into items of architectural woodwork during fabrication, finishing, and installation.
- C. Fire-retardant treatment data for material impregnated by pressure process to reduce combustibility. Include certification by treating plant that treated materials comply with requirements.
- D. Shop drawings showing location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
 - 1. Plastic laminate.
 - 2. Factory-applied opaque finishes.

- E. Samples for verification purposes of the following:
1. Lumber and panel products with factory-applied opaque finish, 8- 1/2 inches by 11 inches for panels and 50 square inches for lumber, for each finish system and color, with one half of exposed surface finished.
 2. Laminate clad panel products, 8-1/2 inches, by 11 inches for each type, color, pattern, and surface finish, with separate samples of unfaced panel product used for core.
 3. Corner pieces as follows:
 - a. Cabinet front frame joints between stiles and rail as well as exposed end pieces, 18 inches high by 18 inches wide by 6 inches deep.
 - b. Miter joints for standing trim.
- F. Product certificates signed by woodwork manufacturer certifying that products comply with specified requirements.
- G. Qualification data for firms and persons specified in "Quality Assurance" article to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, names of Architects and Owners, and other information specified.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Firm experienced in successfully producing architectural woodwork similar to that indicated for this Project, with sufficient production capacity to produce required units without causing delay in the Work.
- B. Single-Source Responsibility: Arrange for production by a single firm of architectural woodwork with sequence matched wood veneers.
- C. Single-Source Manufacturing and Installation Responsibility: Engage a qualified Manufacturer to assume undivided responsibility for woodwork specified in this section, including fabrication, finishing, and installation.

- D. Installer Qualifications: Arrange for installation of architectural woodwork by a firm that can demonstrate successful experience in installing architectural woodwork items similar in type and quality to those required for this project.
- E. AWI Quality Standard: Comply with applicable requirements of "Architectural Woodwork Quality Standards" published by the Architectural Woodwork Institute (AWI) except as otherwise indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect woodwork during transit, delivery, storage, and handling to prevent damage, soilage, and deterioration.
- B. Do not deliver woodwork until painting, wet work, grinding, and similar operations that could damage, soil, or deteriorate woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas whose environmental conditions meet requirements specified in "Project Conditions."

1.6 PROJECT CONDITIONS

- A. Environmental Conditions: Obtain and comply with Woodwork Manufacturer's and Installer's coordinated advice for optimum temperature and humidity conditions for woodwork during its storage and installation. Do not install woodwork until these conditions have been attained and stabilized so that woodwork is within plus or minus 1.0 percent of optimum moisture content from date of installation through remainder of construction period.
- B. Field Measurements: Where woodwork is indicated to be fitted to other construction, check actual dimensions of other construction by accurate field measurements before manufacturing woodwork; show recorded measurements on final shop drawings. Coordinate manufacturing schedule with construction progress to avoid delay of Work.
 - 1. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with manufacture of woodwork without field measurements. Coordinate other construction to ensure that actual dimensions correspond to guaranteed dimensions.

PART 2 - PRODUCTS

2.1 HIGH PRESSURE DECORATIVE LAMINATE MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering high pressure decorative laminates which may be incorporated in the work include but are not limited to the following:
- B. Manufacturer: Subject to compliance with requirements, provide high pressure decorative laminates of one of the following:
 - 1. Wilsonart International
 - 2. Formica Corp.
 - 3. Pionite
 - 4. Nevamar
 - 5. Arborite - Div. of ITW Canada

2.2 MATERIALS

- A. General: Provide materials that comply with requirements of the AWI woodworking standard for each type of woodwork and quality grade indicated and, where the following products are part of woodwork, with requirements of the referenced product standards that apply to product characteristics indicated:
 - 1. Hardboard: ANSI/AHA A135.4
 - 2. High Pressure Laminate: NEMA LD 3.
 - 3. Medium Density Fiberboard: ANSI A208.2.
 - 4. Particleboard: ANSI A208.1
 - 5. Softwood Plywood: PS 1.
 - 6. Formaldehyde Emission Levels: Comply with formaldehyde emission requirements of each voluntary standard referenced below:
 - a. Particleboard: NPA 8.
 - b. Medium Density Fiberboard: NPA 9.
 - c. Hardwood Plywood: HPMA FE.

- B. Fire-Retardant Particleboard: Where indicated, provide panels complying with the following requirements that have fire-retardant chemicals bonded to softwood particles at time of panel manufacture to achieve products identical to those tested for flame spread of 20 or less and for smoke developed of 25 or less per ASTM E 84 by UL or other testing and inspecting organization acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing and inspecting organization.
1. For 45-lb-density panels and thicknesses of 3/4 inch and less, comply with ANSI A208.1 for Grade 1-M-1 except that minimums for modulus of elasticity and screw-holding capacity on face and edge shall be 300,000 psi, 250 lb, and 225 lb, respectively.
 2. For 44-lb-density panels and thicknesses of 13/16 inch to 1-1/4 inch, comply with ANSI A208.1 for Grade 1-M-1 except that minimums for modulus of rupture, modulus of elasticity, internal bond, linear expansion, and screw-holding capacity on face and edge shall be 1300 psi, 250,000 psi, 60 psi, 0.50 percent, 250 lb, and 175 lb, respectively.
 3. Product: Subject to compliance with requirements, provide "Duraflake FR" by Duraflake Div.; Willamette Industries, Inc.

2.3 FABRICATION, GENERAL

- A. Wood Moisture Content: Comply with requirements of referenced quality standard for moisture content of lumber in relation to relative humidity conditions existing during time of fabrication and in installation areas.
- B. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
1. Corners of cabinets and edges of solid wood (lumber) members less than 1 inch in nominal thickness: 1/16 inch.
 2. Edges of rails and similar members more than 1 inch in nominal thickness: 1/8 inch.

- C. Complete fabrication, including assembly, finishing, and hardware application, before shipment to project site to maximum extent possible. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
- D. Factory-cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Smooth edges of cutouts and, where located in countertops and similar exposures, seal edges of cutouts with a water-resistant coating.

2.4 FIRE-RETARDANT-TREATED LUMBER

- A. Low-Hygroscopic Formulation: Interior Type A per AWPA C20.
- B. Fire Performance Characteristics: Provide materials identical to those tested for the following fire performance characteristics per ASTM test methods indicated by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction. Identify treated lumber with classification marking of inspecting and testing organization in the form of separable paper label or, where required by authorities having jurisdiction, of imprint on lumber surfaces that will be concealed from view after installation.
 - 1. Surface Burning Characteristics: Not exceeding values indicated below, tested per ASTM E 84 for 30 minutes with no evidence of significant combustion.
 - a. Flame Spread: 25.
 - b. Smoke Developed: 50.
- C. Mill lumber after treatment, within limits set for wood removal that does not affect listed fire performance characteristics, using a woodworking plant certified by testing and inspecting organization.
- D. Kiln-dry woodwork after treatment to levels required for untreated woodwork. Maintain moisture content required by kiln drying before and after treatment.

- E. Discard treated lumber that does not comply with requirements of referenced woodworking standard. Do not use twisted, warped, bowed, discolored, or otherwise damaged or defective lumber.
- F. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include but are not limited to the following:
 - 1. Koppers Company, Inc.
 - 2. Osmose Wood Preserving, Inc.

2.5 LAMINATE CLAD CABINETS (PLASTIC-COVERED CASEWORK)

- A. Quality Standard: Comply with AWI Section 400 and its Division 400B "Laminate Clad Cabinets."
- B. Grade: Custom.
- C. AWI Type of Cabinet Construction: Flush overlay
- D. Laminate Cladding: High pressure decorative laminate complying with the following requirements:
 - 2. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
 - c. Provide selections made by Architect from laminate manufacturer's full range of standard colors and finishes in the following categories:
 - 1) Solid colors.
 - 2) Patterns.
 - 3. Laminate Grade for Exposed Surfaces: Provide laminate cladding complying with the following requirements for type of surface and grade.
 - a. Horizontal Surfaces Other Than Tops: GP-50 (0.050-inch nominal thickness).
 - b. Postformed Surfaces: PF-42 (0.042-inch nominal thickness).
 - c. Vertical Surfaces: GP-50 (0.050-inch nominal thickness).
 - d. Vertical Surfaces: GP-50 (0.050-inch nominal thickness).

4. Semiexposed Surfaces: Provide surface materials indicated below:

a. High pressure laminate, GP-28.

E. Provide dust panels of 1/4-inch plywood or tempered hardboard above compartments and drawers except where located directly under tops.

2.6 EDGINGS

A. Exposed exterior cabinet front edges shall be banded with a contrasting or matching rigid PVC extrusion, 0.020" thickness, resistant to chip, crack and high impact. Edging shall have a satin finish with a UV cured top coat for additional durability. The 0.020" thick edging shall be applied with waterproof hot melt adhesive.

B. Door and drawer front edges shall be banded with a contrasting or matching rigid PVC extrusion, 3mm (1/8") thickness, resistant to chip, crack, and high impact. Edging shall have a satin finish with UV cured top coat for additional durability. The 3mm thick edging shall be applied with waterproof hot melt adhesive, and shaped to provide radiused edges and radiused corners.

C. Adjustable shelves shall be banded with PVC extrusion, resistant to chip, crack, and high impact. Edging shall have a satin finish with a UV cured top coat for additional durability. Edging shall be applied with waterproof hot melt adhesive. Shelves to be 1" thick. 0.020" thick PVC edging shall be applied to four (4) edges of adjustable shelf.

D. Door and drawer front edges shall be chosen from one of twenty-two (22) trim group colors in 3mm thick PVC in contrasting or matching colors as depicted in manufacturer's color guide.

E. Exposed front edge of cabinet, including exposed interior edges, shall be selected from one of seventy (70) trim group colors in 0.020" thick PVC in contrasting or matching colors as depicted in manufacturer's color guide, or commercial match to selected exposed exterior color based on availability.

2.7 CABINET HARDWARE AND ACCESSORY MATERIALS

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets, except for items specified in Division 8 Section "Finish Hardware."
- B. Cabinet Hardware Schedule: Refer to schedule at end of this section for cabinet hardware required for architectural cabinets.
- C. Hardware Standard: Comply with ANSI/BHMA A156.9 "American National Standard for Cabinet Hardware" for items indicated by reference to BHMA numbers or referenced to this standard.
- D. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with ANSI/BHMA A156.18 for BHMA code number indicated.
 - 1. Satin Stainless Steel, Stainless Steel Base: BHMA 630.
- E. For concealed hardware provide manufacturer's standard finish that complies with product class requirements of ANSI/BHMA A156.9.

2.8 FASTENERS AND ANCHORS

- A. Screws: Select material, type, size, and finish required for each use. Comply with FS FF-S-111 for applicable requirements.
 - 1. For metal framing supports, provide screws as recommended by metal framing manufacturer.
- B. Nails: Select material, type, size, and finish required for each use. Comply with FS FF-N-105 for applicable requirements.
- C. Anchors: Select material, type, size, and finish required by each substrate for secure anchorage. Provide nonferrous metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts and anchors, as required, to be set into concrete or masonry work for subsequent woodwork anchorage.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Condition woodwork to average prevailing humidity conditions in installation areas before installing.
- B. Deliver concrete inserts and similar anchoring devices to be built into substrates well in advance of time substrates are to be built.
- C. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including back priming and removal of packing.

3.2 INSTALLATION

- A. Quality Standard: Install woodwork to comply with AWI Section 1700 for same grade specified in Part 2 of this section for type of woodwork involved.
- B. Install woodwork plumb, level, true, and straight with no distortions. Shim as required with concealed shims. Install to a tolerance of 1/8 inch in 8'-0" for plumb and level and with no variations in flushness of adjoining surfaces.
- C. Scribe and cut woodwork to fit adjoining work and refinish cut surfaces or repair damaged finish at cuts.
- D. Fire-Retardant-Treated Wood: Handle, store, and install fire-retardant-treated wood to comply with recommendations of chemical treatment manufacturer including those for adhesives where are used to install woodwork.
- E. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished matching fastener heads are required, use fine finishing nails for exposed nailing, countersunk and filled flush with woodwork and matching final finish where transparent finish is indicated.

- F. Cabinets: Install without distortion so that doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated.
- G. Complete the finishing work specified in this section to whatever extent not completed at shop or before installation of woodwork.

3.3 ADJUSTMENT AND CLEANING

- A. Repair damaged and defective woodwork where possible to eliminate defects functionally and visually; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean woodwork on exposed and semiexposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

3.4 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensures that woodwork is being without damage or deterioration at time of Substantial Completion.

3.5 HARDWARE SCHEDULE

- A. Five Knuckle Hinges: No. HO5376-SS (brushed stainless steel) by Rockford Process Control, Inc.
- B. Door Magnetic Catch: No. MO7-03941-66 (white) by Rockford Process Control, Inc. with matching strike.
- C. Wire Pulls: #P604SS (4" c/c) Finish: stainless steel, by Rockford Process Control.
- D. Locks: TLCB250 by Timberline with Masterkey and all associated accessories for mounting.
- E. Adjustable Shelf Support Clip: 2822-00 ITW Fastex, Des Plaines, IL.

END OF SECTION 06402

SECTION 07512 – BUILT UP COAL TAR ROOFING

PART I - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SCOPE OF WORK

- A. Furnish and install specified roofing and related components to **Warren Woods Public Schools**.
- B. Work includes:
 - 1. Localized deck reattachment/repair/replacement if necessary.
 - 2. Installation of the following:
 - a. Tapered insulation (**Designated areas only**).
 - b. Crickets/Saddles installed in designated areas.
 - c. Cold process built-up roofing system.
 - d. Gravel surfaced.
 - e. Specified flashings and accessories.

1.03 QUALITY CONTROL

- a. Contractor shall:
 - i. Submit an affidavit attesting the Contractor has in place and fully implemented a written Health, Safety, and Environmental Plan and the plan is compliant with all applicable Federal, State, and Local regulations.
 - ii. Be experienced in cold process built-up roofing.
 - 1. 5 years minimum.
 - iii. Be acceptable by Owner.
 - iv. Be a Manufacturer Certified Contractor.
 - v. Be Approved by manufacturer. The contractor shall be required to acquire inspection days utilizing manufacturer's technical inspectors. The minimum number of Technical Service full time inspection days will be three (4) days for a project of 200 squares (1858 m²) or less. The number of days will increase at a rate of one (1) day for each additional 100 squares (929 m²).
 - vi. Has not been in Chapter 7 during the last ten (10) years.

- b. Roofing material manufacturer shall:
 - i. For the purpose of this specification, a manufacturer must:
 - 1. Own or lease a facility which manufactures major roof system components for at least one year prior to the date of this specification.
 - 2. Own or lease equipment to manufacture major roof system components and operate that equipment at a facility it owns or leases.
 - 3. Employ personnel on a full-time basis to process raw materials into finished major roof system components at a manufacturing facility and using the equipment which the supplier owns or leases. Manufacturing is the handling and processing of raw materials into finished goods which are sold to installers and/or users of those products without further processing.
 - ii. Building Owner, to assure that the manufacturer can consistently deliver quality materials, requires the Manufacturer to provide evidence of twenty (20) quarters of continuous plant inspections of roofing manufacturing sites over the past five (5) years by an independent Nationally Recognized Testing Laboratory (NRTL) as defined in 29 CFR Ch. XVII (7-1-93 Edition) from the Occupational Safety and Health Administration (OSHA).
 - iii. To help ensure ethical conduct, reduce the potential for conflict of interest, and to provide full disclosure, the supplier of the major roof system components will provide an affidavit of a company officer which shall include:
 - 1. Confirmation that all field employees in their organization have signed an ethics policy agreeing they will conduct business in an ethical manner.
 - 2. The name and address of each consultant paid by the supplier for specifying, recommending, or soliciting the supplier's products for the project.
 - iv. Provide Owner names of at least 5 qualified applicators.
 - v. Employ Field Technical Services Representative available for monitoring project work on a full-time basis.
 - vi. Employ Field Technical Services Representatives available for final roof inspection.
 - vii. Provide local Field Representative to make periodic site visits, report work quality and job progress.
 - viii. Provide list of at least 5 projects available for inspection employing same roofing system.
 - 1. Project must be within 25 mile radius of Owner's building.
 - ix. The presence and activity of the manufacturer's/ specifier's

representative and/or Owner's representative shall in no way relieve the contractor of contract responsibilities or duties.

- c. Project meetings:
 - i. Pre-Bid Conference:
 1. Will be held at place and time determined by owner.
 2. Attendance:
 - a. Roofing material manufacturer/specifier
 - b. Contractor
 - c. Owner.
 - d. Architect.
 3. Agenda:
 - a. Distribution of contract documents.
 - b. Review of specification.
 - ii. Pre-construction conference:
 1. Will be scheduled by Owner within fifteen (15) days after notice of award.
 2. Attendance:
 - a. Roofing material supplier/specifier
 - b. Contractor
 - c. Representative of Owner.
 - d. Architect.
 3. Agenda:
 - a. Submittal of executed bonds.
 - b. Distribution of contract documents.
 - c. Walkover inspection.
 - d. Submittal of insulation layout.
 - iii. Progress meetings:
 1. Will be scheduled by Owner as required.
 2. Attendance:
 - a. Roofing material manufacturer/specifier/ contractor.
 - b. Job superintendent.
 - c. Owner.
 - d. Architect.
 3. Minimum agenda:
 - a. Review of work progress.
 - b. Field observations, problems, and decisions.
 - c. Corrective measures to regain projected schedules.
 - d. Other business relating to work.
 - iv. Final inspection:
 1. Will be scheduled by roofing material manufacturer upon job completion.
 2. Attendance:

- a. Contractor.
- b. Roofing material manufacturer/specifier.
- c. Roofing material manufacturer/ technical service representative.
- 3. Minimum agenda:
 - a. Walkover inspection.
 - b. Identification of problems which may impede issuance of warranty.
- d. Random sampling:
 - i. Roofing material:
 - 1. During course of work, Owner's Representative may secure samples according to ASTM D 140-98 of materials being used from containers at job site and submit them to an independent laboratory for comparison to specified material.
 - 2. Should test results prove that a material is not functionally equal to specified material:
 - a. Contractor shall pay for all testing.
 - b. Roofing installed and found not to comply with the specifications shall be removed and replaced at no change in the contract price.
- e. Regulatory requirements:
 - i. Michigan Building Code 2009 Ed.
 - ii. NFPA 101 1997 & current edition.
 - iii. UL Classified Fire Rating - UL 790.
 - 1. Class A.
 - iv. UL Classified Wind Uplift Resistance - UL 1897.
 - v. FM Approved Roof Perimeter System.
- f. Plans and specifications:
 - i. Contractor must notify Owner and specifier of any omissions, contradictions or conflicts seven (7) days before bid date. Owner and specifier will provide necessary corrections or additions to plans and specifications by addendum. If Contractor does not so notify Owner and specifier of any such condition, it will be assumed that the Contractor has included the necessary items in the bid to complete this specification.
 - ii. It is the intent that this be a completed project as far as the contract documents set forth. It is not the intent that different phases of work on this project be delegated to various trades and subcontractors by the contract documents. Contractor must make own contracts with various subcontractors, setting forth the work these subcontractors will be held responsible for. Contractor alone

- will be held responsible by the owner for the completed project.
- iii. If the Contractor feels a conflict exists between what is considered good roofing practice and these specifications contractor shall state in writing all objections prior to submitting quotations.
 - iv. It is the Contractor's responsibility during the course of the work, to bring to the attention of and notify the Owner's representative first verbally, then in writing, of any defective membrane, insulation or deck discovered where not previously identified.

1.04 REFERENCES

- a. AISI - American Iron and Steel Institute, Washington, DC.
- b. ARMA - Asphalt Roof Manufacturers Association, Calverton, MD.
- c. ASTM - American Society for Testing and Materials, West Conshohocken, PA.
- d. NRCA - National Roofing Contractors Association, Chicago, IL.
- e. SMACNA - Sheet Metal and Air Conditioning Contractors National Association, Chantilly, VA.
- f. UL - Underwriters Laboratories, Northbrook, IL.

1.05 SUBMITTALS

- a. Submit prior to contract award date:
 - i. Roofing System Manufacturer's Warranty:
 - 1. Copy of warranty to be issued upon successful completion of roofing project and final inspection.
 - ii. UL Listing of Fire Resistance Rating:
 - 1. Copy of UL Listing for the specified roof system from the current UL Roofing Materials and Systems Directory or from letters issued by UL to the manufacturer.
 - iii. Red label products:
 - 1. Written verification from roofing material manufacturer that cold process coatings are not flammable (red label).

- iv. Product data:
 - 1. Product data sheets.
 - 2. Material safety data sheets.

1.06 DELIVERY, STORAGE AND HANDLING

- a. Delivery of materials:
 - i. Deliver materials to job-site in new, dry, unopened, and well-marked containers showing product and manufacturer's name.
 - ii. Deliver materials in sufficient quantity to allow continuity of work.
 - iii. Coordinate delivery with Owner.
- b. Do not order project materials or start work before receiving Owner's written approval.
- c. Storage of materials:
 - i. Store roll goods on ends only. Discard rolls which have been flattened, creased, or otherwise damaged. Place materials on pallets. Store roll goods on level pallets. Do not stack pallets. Store materials marked "KEEP FROM FREEZING" in areas where temperatures will remain above 40°F (5°C).
 - ii. Store metal roof deck on pallets with one end elevated to provide drainage.
 - iii. For insulation, remove plastic packaging shrouds. For felt rolls, slit the top of the plastic shrink wrap only. Cover top and sides of all stored materials with tarpaulin (not polyethylene). Secure tarpaulin.
 - iv. Do not store materials in open or in contact with ground or roof surface.
 - v. Store all materials on a raised platform covered with secured canvas tarpaulin (not polyethylene), top to bottom. Cover all materials when project is not in progress and maintain the ability at all times to cover the materials when required, such as during an unanticipated rain shower.
 - vi. Contractor shall assume full responsibility for the protection and safekeeping of products stored on premises.

- d. Material handling:
 - i. Handle materials to avoid bending, tearing, or other damage during transportation and installation.
 - ii. Material handling equipment shall be selected and operated so as not to damage existing construction or applied roofing. Do not operate or situate material handling equipment in locations that will hinder smooth flow of vehicular or pedestrian traffic.

1.07 SITE CONDITIONS

- a. Field measurements and material quantities:
 - i. Contractor shall have SOLE responsibility for accuracy of all measurements, estimates of material quantities and sizes, and site conditions that will affect work.
- b. Existing conditions:
 - i. Building space directly under roof area covered by this specification will be utilized by on-going operations. Do not interrupt Owner operations unless prior written approval is received from Owner.
 - ii. Access to roof shall be from exterior only.
 - iii. Move air-conditioning units and other equipment as required to install roofing materials complete and in accordance with plans and specifications. When units and equipment are to be moved, they shall be carefully disconnected and removed to a protected area so as not to damage any part or component thereof. Reconnect units in such a way that they are restored to a prior work operating condition. Take appropriate measures to prevent dust, vapors, gases or odors from entering the building during roof removal, replacement or repair.
 - iv. All disconnection and re-connection shall be performed by a mechanical an/or electrical company licensed to perform such work.
- c. Asbestos:
 - i. Owner and Contractor agree to exonerate, indemnify, defend, and hold harmless roofing material manufacturer from and against all claims, demands, lawsuits, damages, expenses and losses incurred by Contractor's removal of asbestos-containing materials from Owner's building and work site. Contractor must conduct its operations according to applicable requirements including but not limited to those established by:

1. Occupation Safety and Health Administration (OSHA).
 2. Environmental Protection Agency (EPA).
 3. Department of Transportation (DOT).
 4. State or Local Air Pollution Control Authorities/Agencies.
 5. State or Local Solid Waste or Hazardous Waste Authorities/Agencies.
 6. State or Local Health Department(s).
 7. State or Local Building Code Authorities.
 8. Other federal, state or local agencies or authorities.
- ii. Contractor or Owner shall perform appropriate inspections, surveys and file timely notifications to proper authorities prior to starting roof renovation or demolition activities. Inspectors, project planners, project managers, contractors and workers involved in the roof project shall have appropriate training, licenses and registrations. Contractor and Owner shall be responsible for determining and implementing regulatory compliance activities, including but not limited to work practices, engineering controls, personal protection, air monitoring, testing, hazard communication, material handling, record retention, and arranging for waste disposal/handling.
- iii. Contractor must file a Uniform Hazardous Waste Manifest from proper landfill site for each load of asbestos containing material removed. Copies must be sent to Owner and material manufacturer/ specifier. Transportation of waste shall be in accordance with applicable Department of Transportation (DOT) requirements.
- d. Waste Disposal:
- i. Do not re-use, re-cycle or dispose of material manufacturers product containers except in accordance with all applicable regulations. The user of manufactured products is responsible for proper use and disposal of product containers.
- e. Safety requirements:
- i. All application, material handling, and associated equipment shall conform to and be operated in conformance with OSHA safety requirements.
 - ii. Comply with federal, state, local and Owner fire and safety requirements.
 - iii. Advise Owner whenever work is expected to be hazardous to Owner, employees, and/or operators.

- iv. Maintain a crewman as a floor area guard whenever roof decking is being repaired or replaced.
- v. Maintain fire extinguisher within easy access whenever power tools, roofing kettles, fuels, solvents, torches, and open flames are being used.

- f. Environmental requirements:
 - i. Do not work in rain, snow, or in presence of water.
 - ii. Do not install materials marked "KEEP FROM FREEZING" when daily temperatures are scheduled to fall below 40°F (5°C).
 - iii. Do not perform masonry work below 40°F (5°C).
 - iv. Remove any work exposed to freezing.
 - v. Advise Owner when volatile materials are to be used near air ventilation intakes so Owner can use some or all of the following methods to minimize disruptions to building occupants and operations:
 - 1. Divert air intake from work area by attaching scoops or temporary duct work.
 - 2. Temporarily shut down or block air intakes.
 - 3. Provide make-up air or intake air from sources away from work area.

- g. Security requirements:
 - i. Comply with Owner security requirements.
 - ii. Require identification be displayed by all persons employed on this project.

- h. Temporary sanitary facilities:
 - i. Furnish, install, and maintain temporary sanitary facilities for employee use during project. Remove on project completion.
 - ii. Place portable toilets in conformance with applicable laws, codes, and regulations.

1.08 SUBSTITUTIONS

- a. When a particular make or trade name is specified, it shall be indicative of standard required. Bidders proposing substitutes shall submit the following 7 days prior to bid date to Owner:
 - i. Written application with explanation of why it should be considered.
 - ii. Accredited testing laboratory certificate comparing substitute's physical/performance attributes to those specified.

- b. Only substitutes approved in writing by Owner and architect prior to scheduled bid date will be considered.
- c. Notification of approvals will be mailed at least 1 days before bid opening.
- d. Owner reserves right to be final authority on acceptance or rejection of any substitute.

1.09 PAYMENT SECURITY

- a. Any of the following:
 - i. Joint Check: Payments will be made by Joint Check to the contractor and material supplier. Owner receives automatic Waiver of Lien from material supplier upon receipt of canceled check.
 - ii. Letter of Credit: Contractor shall purchase Letter of Credit from bank to secure payment to material supplier.
 - iii. COD: Certified Check shall be paid by the contractor to material supplier via common carrier upon receipt of delivery.
 - iv. Payment & Performance Bonds: Contractor purchases Payment and Performance Bonds for benefit of Owner and material supplier. Bonding company/surety shall be rated B+ or better in current Key Rating Guide as issued by A. M. Best Co., Oldwick, NJ.
- b. Progress payments:
 - i. Contractor shall establish with Owner, Owner's procedure for payment and retainages prior to commencement of work on this project.
 - ii. Partial or progress payments shall not relieve Contractor of performance obligations under this contract, nor shall such payments be viewed as approval or acceptance of work performed.
 - iii. Final payment shall be withheld until all provisions of the specifications are met.

1.10 UNIT PRICES

- a. Quote unit prices on:
 - i. Deck repair - \$/sq. ft.
 - ii. Wood blocking replacement - \$/linear ft. or meter.

1.11 WARRANTY/GUARANTEE

- a. Guarantee:
 - i. Upon project completion and Owner acceptance, effective upon complete payment, Contractor shall issue Owner a guarantee against defective workmanship and materials for a period of two (2) years.

- b. Warranty:
 - i. Upon project completion, Manufacturer acceptance, and once complete payment has been received by both Contractor and Manufacturer, Manufacturer shall deliver to Owner a fifteen (15) year manufacturer Roofing System Quality Assurance Warranty and Owner's Manual. Manufacturer will, during the second, fifth and tenth year of this warranty, inspect and provide a written Executive Summary.

PART II - PRODUCTS

2.01 GENERAL

- a. Comply with quality control, references, specifications, and manufacturer's data. Products containing asbestos are prohibited on this project. Use only asbestos-free products.

- b. Use products with personal protection. User must read container label and material safety data sheets prior to use.

2.02 ACCEPTABLE MANUFACTURERS

- a. Tremco Inc., Cleveland, OH 216/292-5000 or approved equal that meets or exceeds specified standards.

2.03 ROOF DECKING

- a. Metal roof deck:
 - i. Gage, rib depth, rib configuration - match existing; three (3) span; lapped and stitched joints.
 - ii. Sheet steel: ASTM A 446/A 446M-93, Grade A structural quality; with G90 coating (galvanized).
 - iii. Butt and finish strips: Twenty (20) gage sheet steel.

- iv. Acceptable manufacturers:
 - 1. Consolidated Systems, Inc., Columbia, SC.
 - 2. Roll Form Products, Inc., Boston, MA.
 - 3. Roof Deck, Inc., Hightstown, NJ.
 - 4. United Steel Deck, Inc., Summit NJ.
 - 5. Verco Manufacturing Co., Phoenix, AZ.
 - 6. Vulcraft Division, Nucor Corp., Florence, SC.
 - 7. Wheeling Corrugating Co., Division Wheeling-Pittsburgh Steel Corp., Wheeling WV.
- v. Metal roof deck fasteners: TRAXX by ITW Buildex, Itasca, IL.
- vi. Deck sidelap stitching: 10-16 x 3/4 inch (19 mm) Hex Washer Head, TRAXX, #1 Drill Point.
- vii. Deck to bar joist: 12-24 x 7/8 inch (22 mm) Hex Washer Head, TRAXX, #4 Drill Point.
- viii. Deck to structural steel: 12-24 x 1-1/4 inch (32 mm) Hex Washer Head, TRAXX, #5 Drill Point.

2.04 WOOD BLOCKING & CURBS

- a. Lumber:
 - i. American Lumber Standard Committee (ALSC) No. 2 grade Southern Pine; free from warping and visible decay; pressure-treated according to AWPA Standard C2 for lumber and timber with CCA, ACA, ACQ-B, ACQ-D, ACZA, or CC to a retention of 4.0 kg/m³ (0.25 pcf) for above ground use.
 - 1. Wood blocking: 2" x 6" (50 mm x 150 mm) minimum.
- b. Wood cant: 4" x 4" (100 mm x 100 mm) cut on bias.

2.05 INSULATION

- A. Tapered insulation system: (**Designated areas only**)
 - 1. FS HH-I-1972/2(1), Class 1, isocyanurate insulation.
 - a. Black glass fiber reinforced facer.
 - 2. Slope: ¼ per running foot.
 - 3. Minimum thickness: ½ inch.
- B. Tapered insulation adhesive:
 - 1. Single component solvent free insulation adhesive

- C. Bottom layer:
 - i. ASTM C 1289-98, FS HH-I-1972/2(1), Class 1, isocyanurate.
 - ii. Black, glass fiber reinforced, non-asphaltic facer.
- D. Bottom layer thickness: 4' x 8' x 1.5".
 - 1. Mechanically fasten.
- E. Second layer insulation:
 - 1. ASTM C 1289-98, FS HH-I-1972/2(1), Class 1, isocyanurate.
 - 2. Black, glass fiber reinforced, non-asphaltic facer.
 - 3. Thickness: 4"x 8" x1.5".
- F. Insulation adhesive for second layer
 - 1. Single component solvent free insulation adhesive.
- G. Top layer insulation:
 - 1. ASTM C 208-95, Type II, Asphalt coated high density wood fiber insulation.
 - 2. Top layer thickness: ½" (13 mm).
- H. Top layer insulation adhesive:
 - 1. Single component solvent free insulation adhesive.
- I. Crickets/Saddles:
 - 1. ASTM C 208-95, asphalt coated fiberboard, factory fabricated, 2' x 4' (610 mm x 1220 mm) dimension. Slope shall be twice (2 times) the roof system slope, with a minimum of 1/2 inch per foot (41.6 mm per meter).
- J. Cricket/Saddle adhesive:
 - 1. Single component solvent free insulation adhesive.

2.06 MECHANICAL FASTENERS

- a. Insulation to steel deck:
 - i. Deckfast #12 screw, plastic disc or metal plate by Construction Fasteners, Inc., Wyomissing, PA.
 - ii. Insul-Fixx #12, plastic disc or metal plate by SFS Stadler, Brunswick, OH.
 - iii. Olympic Fastener #12-10, plastic or metal plate by Olympic Manufacturing Group, Agawam, MA.
 - iv. Rawl Deck #12 Deck Screw, plastic or metal plate by The Rawlplug Co., Inc., New Rochelle, NY.
 - v. ROOFGRIP, plastic disc or metal plate by ITW Buildex, Itasca, IL.

- vi. Insul-Tite #12, plastic disc or metal plate by Burlington Mfg. Corp., Archbold, OH.
- vii. Length: Use the shortest fastener which will penetrate the top flange of the steel deck 3/4 inch (19 mm).

- b. Wood to wood:
 - i. Galvanized, common, annular ring nail.
 - ii. Length: Sufficient to penetrate underlay blocking 1-1/4 inches (32 mm).

- c. Wood to masonry:
 - i. Tremco/Olympic No. 14-10 Heavy Duty Roofing Fastener with CR-10 fluorocarbon coating by Tremco.
 - ii. Length: Sufficient to provide minimum 1-1/2 inches (38 mm) embedment.

- d. Wood to concrete:
 - i. Tapcon 1/4 inch (6.35 mm) diameter, Phillips flat head anchor by Buildex Div. of ITW, Itasca, IL.
 - ii. Length: Sufficient to provide minimum 1-1/2 inches (38 mm) embedment.

- e. Wood to steel deck:
 - i. Deckfast #12 screw, by Construction Fasteners, Inc., Wyomissing, PA.
 - ii. Insul-Fixx #12, by SFS Stadler, Brunswick, OH.
 - iii. Insul-Tite #12, Burlington Mfg. Corp., Archbold, OH.
 - iv. Olympic Fastener #12-10, by Olympic Manufacturing Group, Agawam, MA.
 - v. Rawl Deck #12 Deck Screw, by The Rawlplug Co., Inc., New Rochelle, NY.
 - vi. ROOFGRIP #12, by ITW Buildex, Itasca, IL.
 - vii. Length: Use the shortest fastener which will penetrate the top flange of the steel deck 3/4 inch (19 mm).

- f. Aluminum sheet metal to wood blocking:
 - i. FS FF-N-105B(3) Type II, Style 20, roofing nails; 6061-t913 alloy wire, flat head, diamond point, round, barbed shank.
 - ii. Length: Sufficient to penetrate wood blocking 1-1/4 inches (32 mm) minimum.

- g. Termination bar to masonry/concrete:
 - i. Lead masonry anchors.
 - ii. Length: Sufficient to provide 1-1/4 inches (32 mm) embedment minimum.
- h. Drawband:
 - i. Gold Seal stainless steel worm gear clamp by Murray Corporation, Cockeysville, MD.
 - ii. Power-Seal stainless steel worm drive clamps by Breeze Clamp Company, Saltsburg, PA.

2.07 ROOFING MATERIALS

- a. Adhesives:
 - iii. Interply adhesive:
 - 2. Cold process interply mastic.
 - iv. Surfacing adhesive:
 - 3. Cold process surfacing adhesive.
- b. Ply sheet:
 - i. Trilaminar reinforced ply sheet.
- c. Related materials:
 - i. Asphalt mastic:
 - 1. ASTM D 4586-93 fibrated asphalt mastic.
 - ii. Compressible insulation:
 - 1. Mineral wool or fiberglass batt insulation.
 - iii. Cant strip:
 - 1. Mechanically attached.
 - iv. Flashing adhesive:
 - 1. Elastomeric flashing adhesive modified with butyl rubber.
 - v. Stripping mastic for elastomeric flashing:
 - 1. Modified Bituminous Mastic
 - vi. Flashing surfacing:
 - 1. VOC compliant nonfibred aluminum coating.
 - vii. Flashing sheet:
 - 1. Reinforced SBR/EPDM Elastomeric Sheeting.
 - viii. Roofing aggregate:
 - 1. Hard, durable, opaque; double washed free of clay, loam, sand or other foreign substances.

2. Do not use: Crushed gravel, white dolomite (marble chips), Joplin chats, scoria, limestone, volcanic rock, crushed oyster and clam shells, crushed brick tile, or cinders.
3. ASTM D 1863-93, size six (6) (3/4" to 3/8" range) (19 to 9.5 mm).
- ix. Sealants:
 1. Coping sealant:
 - a. FS TT-S-00230C(2), single component, polyurethane sealant.
 2. Drawband sealant:
 - b. FS TT-S-00230C(2), single component, polyurethane sealant.
- x. Termination bar sealant:
 1. FS TT-S-00230C(2), single component, polyurethane sealant.
- xi. Stripping ply adhesive:
 1. Cold process adhesive.
- xii. Stripping ply:
 1. Non-shrinking, non-rotting, woven glass mesh.
- xiii. Walkway panels:
 1. 3 ft. x 4 ft. (915 mm x 1220 mm), granule surfaced, fiberglass reinforced asphaltic pad.

2.08 METAL FLASHINGS

- a. Termination bar:
 - i. ASTM B 221-93 - aluminum bar:
 1. 1/8 x 1 inch (3.2 x 25.4 mm).
- b. Counterflashing:
 1. Thickness: 0.050 inches (1.2 mm).
- c. Coping cap:
 - a. Pre-engineered, concealed fastener attached coping cap system.
- a. Expansion joint:
 - i. Galvanized, pre-painted: Twenty-four (24) gage minimum, galvanized steel; commercial quality, Fed. Spec. QQ-S-775, Type I, Class D or ASTM A 526 or lockforming quality ASTM A 527, G90 coating in accordance with ASTM A 525. All sheet metal to be pre-painted.

1. Paint finish at exposed side: Factory applied baked-on two (2) coat system comprised of one (1) coat of full 70% resin fluorocarbon (polyvinylidene fluoride PVF2) by Kynar 500 or accepted substitute over a smooth coat of corrosion-resistant epoxy-based primer. Color as selected by owner.
 2. Finish at underside shall be a washcoat over a coat of corrosion-resistant epoxy-based primer.
 3. Repaint existing sheet metal scheduled for reuse; two (2) coats of Alkyd Semi-gloss Enamel over one (1) coat of galvanized steel primer. Ameritone, Kelly-Moore, Miller, Rodda or accepted substitute.
- b. Lead Flashings:
- i. ASTM B 29-92(1997), 4 lb. (1.82 kg) sheet lead.
- c. Details not addressed in specification shall be in accordance with Architectural Sheet Metal Manual, as issued by Sheet Metal and Air Conditioning Contractors' National Association, Inc., (SMACNA).

2.09 SYSTEM PERFORMANCE REQUIREMENTS:

Property	a. COLD PROCESS INTERPLY & SURFACING ADHESIVE	
	Typical Value	Test Method
Asbestos content	None	EPA 600/R-93/116
Viscosity @ 25°C	25 - 75 Pa · s (25000-75000 cP)	ASTM D 2196-86 (1991)
Density @ 25°C	1.0 kg/L (8.4 lb./gal.)	ASTM D 6511-00
Nonvolatile Matter	67%	ASTM D 6511-00
Asphalt content, min	42%	ASTM D 6511-00
Flash point	> 37°C (100°F)	ASTM D 93-97
Uniformity & Consistency	Pass	ASTM D 6511-00
VOC	340 g/L	ASTM D 6511-00

b. TRILAMINATE REINFORCED PLY SHEET			
Property	Typical Value	Test Method	
Weight	1.5 kg/m ² (31 lb/100 ft ²)	ASTM D 228-90a	
Breaking strength	600 N MD (135 lbf/in.) 575 N XD (130 lbf/in.)	ASTM D 146-90	
ASTM D 146-90 (1/2") radius bend		Pliability, 12.7 mm	No failures
Mass of desaturated polyester/glass mat, min	107 g/m ² (2.2 lb/100 ft ²)	ASTM D 146-90	
Surfacing & stabilizer, max	65%	ASTM D 4601-91	
Asphalt	485 g/m ² (10 lb/100 ft ²)	ASTM D 228-90a	
Resistance to puncture	530 N (120 lbf)	ASTM E 154-88	

c. THREE (3) PLY TRILAMINATE REINFORCED COLD PROCESS ROOFING SYSTEM			
Property	Typical Value	Test Method	
Tensile strength @ -18°C (0°F)	68.3 N/mm MD (390 lbf/in.) 70.0 N/mm XD (400 lbf/in.)	ASTM D 2523-78 (1984)	
Elongation @ -18°C (0°F)	3.6% MD 3.9% XD	ASTM D 2523-78 (1984)	
Coefficient of linear thermal expansion	3.9 E-05in/in/°F MD 3.8 E-05in/in/°F XD	ASTM C 426 (Modified)	
Thermal shock factor	493°C (920°F) MD 571°C (1060°F) XD	NBS BSS No. 55	

d. NON-SHRINKING, NON-ROTTING WOVEN GLASS MESH			
<u>Property</u>	<u>Typical Value</u>	<u>Test Method</u>	
Weight	65 g/m ² (1.32 lb/100 ft ²)	ASTM D 146-90	
Moisture based on net weight	None	ASTM D 146-90	
Average tensile strength @	25°C (77°F)		
Warp threads	289 N (65 lbf)	ASTM D 146-90	
Filling threads	311 N (70 lbf)	ASTM D 146-90	
Organic content			
Weight	18.7%	ASTM D 579-90	
Type	PVC/acrylic water-based		

e. VOC COMPLIANT NON FIBERED ALUMINUM COATING			
<u>Property</u>	<u>Typical Value</u>	<u>Test Method</u>	
Asbestos content	None	ASTM D276-87 (1999)	
Viscosity @25°C (77°F) (Ford Cup No. 4)	22 sec	ASTM D1200-94	
Density @25°C (77°F)	952 kg/m ³ (7.95 lb/gal)	ASTM D1475-96	
Nonvolatile content	48% minimum	ASTM D1644-88 (1993)	
Metallic aluminum content	15% minimum	ASTM D2824-94	
VOC*	495 g/L	ASTM D3960-98	

* Volatile Organic Compound

	f.	FIBRATED ASPHALT MASTIC	
<u>Property</u>		<u>Typical Value</u>	<u>Test Method</u>
Asbestos content		None	ASTM D 276-87
Viscosity @ 25°C (77°F)		480 - 1000 Pa · s (480000-1000000 cP)	ASTM D 2196-86 (1991)
Density @ 25°C (77°F)		1114 kg/m ³ (9.3 lb/gal)	ASTM D 1475-90
Nonvolatile Matter		80%	ASTM D 4586-93
Behavior at 140° F (Sag Resistance)		3.18 mm (1/8 in.)	ASTM D 4586-93
Moisture vapor transmission rate		2 - 6 g/m ² /24 hrs. @ 0.51 mm (0.10 - 0.40 g/100 in. ² / 24 hrs @ 0.020 in.) thickness	ASTM E398-83
	g.	SOLVENT FREE INSULATION ADHESIVE	
<u>Property</u>		<u>Typical Value</u>	<u>Test Method</u>
Volatile Organic Compound		20 g/L	ASTM D 3960-93
Asbestos Content		None	EPA 600/R-93/116
Viscosity @ 25°C (77°F)		70 Pa · s (70,000 cP)	ASTM D 2556-93a
NonVolatile Content		98%	ASTM D 1644-88(1993)
Density @25°C (77°F)		1016 kg/m ³ (8.5 lb./gal.)	ASTM D 1875-90
Tensile Strength @25°C (77°F)		1379 kPa (200 psi)	ASTM D 412-92
Elongation @25°C (77°F)		1200%	ASTM D 412-92
Adhesion Strength in shear @ 25°C (77°F)		552 (80 psi)	ASTM D 816-82(1993)
T-Peel Adhesion @25°C (77°F)		66 N (15 lbf/in.)	ASTM D 1876-93
Cold Brittleness		Pass @ -51°C (-60°F)	ASTM D 816-82(1993)

h. REINFORCED SBR/EPDM ELASTOMERIC FLASHING SHEET		
<u>Property</u>	<u>Typical Value</u>	<u>Test Method</u>
Thickness	0.045 in (1.14 mm)	ASTM D 751-89
Breaking strength	261 lbf/in MD (45.7 kN/m) 150 lbf/in XD (26.3 kN/m)	ASTM D 751-89
Elongation	25 %	ASTM D 751-89
Tearing strength	94 lbf (421 N) MD 59 lbf (266 N) XD	ASTM D 751-89
Dimensional stability	0.2%	ASTM D 1204-84
Low temperature flexibility	-40 °F(-40 °C)	ASTM D 2136-84 (1989)

i. MODIFIED ASPHALT MASTIC		
<u>Property</u>	<u>Typical Value</u>	<u>Test Method</u>
Asbestos content	None	ASTM D276-87
Volatile Organic Compounds	300 g/L, max	ASTM D3960-89
Viscosity @ 25°C (77°F)	600,00-2,000,000 cP (600-2,000 Pa · s)	ASTM D2196-86
Density @25°C (77°F)	970 kg/m ³ (8.1 lb/gal)	ASTM D1475-85
Nonvolatile Matter	65%	ASTM D4586-86
Tensile strength @25°C (77°F)	40 - 100 psi (275 - 690 kPa) @ 100% elongation	ASTM D412-87
Elongation @ 25°C (77°F)	1,000%	ASTM D412-87
Elongation @ -34°C (-30°F)	100%	ASTM D412-87
Recovery from 500% elongation	90% min.	ASTM D412-87
Moisture vapor transmission rate	0.50 - 1.10 g/100in ² /24 hrs	ASTM E398-83(1988)
Behavior at 60°C (140°F) [Sag Resistance]	6 mm (max) (1/4 in. max)	ASTM D4586-86
Flexibility @-40°C (-40°F)	No cracking	TRC 737

j. BLACK HYPALON ELASTOMERIC FLASHING ADHESIVE

<u>Property</u>	<u>Typical Value</u>	<u>Test Method</u>
Asbestos content	None	ASTM D 276-87
Viscosity @ 77°F (25°C)	400,00-1,760,000cP (400-1760 Pa · s)	ASTM D 2196-86
Density @ 77°F (25°C)	8.7 lb/gal (1042 kg/m ³)	ASTM D 1475-85
Adhesion in peel, min (0.52 kN/m)	3 lbf/in	ASTM D 1876-72 (1983)
Lap shear adhesion, min (124 kPa)	18 psi	ASTM D 816-82
VOC	250 g/L	ASTM D 3960-89

k. SOLVENT FREE, ELASTOMERIC ROOFING ADHESIVE

<u>Property</u>	<u>Typical Value</u>	<u>Test Method</u>
Asbestos content	None	EPA/600/R-93/116
Viscosity @ 77°F (25°C)	600000-2000000 cP (600-2,000 Pa · s)	ASTM D 2196-86 (1991)
Density @ 77°F (25°C)	8.6 lb/gal (1031 kg/m ³)	ASTM D 1475-90
Tensile Strength @ 77°F (25°C) @ 100% elongation	30-50 psi (207 - 345 kPa)	ASTM D 412-87
Elongation @ 77°F (25°C)	300%	ASTM D 412-87
Behavior @ 140°F (60°C) (Sag Resistance)	1/4 in. (6mm) max	ASTM D 4586-93

<u>Property</u>	I.	<u>ONE-PART POLYURETHANE SEALANT</u> <u>Typical Value</u>	<u>Test Method</u>
Tensile strength		1241 kPa (180 psi)	ASTM D 412-87
Ultimate elongation		550%	ASTM D 412-87
Adhesion-in-peel		4.4 N/mm (25 lbf/in.)	ASTM C 794-80 (1986)
Weep & sag		Passes	ASTM C 639-83
Staining		Passes	ASTM C 510-77 (1983)
Weight-loss, cracking & chalking after heat aging		Passes	ASTM C 792-75 (1987)
Hardness @ 25°C (77°F), 50% RH (Shore A)		25 ± 5	ASTM C 661-86
Durability (Bond & Cohesion)		Passes (On mortar, granite, and anodized aluminum at ± 25% movement)	ASTM C 719-86

PART III - EXECUTION

3.01 EXAMINATION

- a. Verify conditions as satisfactory to receive work.
- b. Do not begin roofing until all unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions.
- c. Verify that work of other trades penetrating roof deck or requiring men and equipment to traverse roof deck has been approved by Owner, manufacturer, and roofing contractor.
- d. Check projections, curbs, and deck for inadequate anchorage, foreign material, moisture, or unevenness that would prevent quality and execution of new roofing system.

3.02 GENERAL WORKMANSHIP

- a. All work performed by Contractor shall conform to this specification.
- b. The presence and activity of the manufacturer's representative, architect's representative, and/or Owner's representative shall in no way relieve Contractor of contract responsibilities or duties.
- c. Substrate: Free of foreign particles prior to laying roof membrane.
- d. Provide additional fastening of mechanically attached base sheets in roof perimeter and corner areas.
- e. Phased application: Not permitted. All plies shall be completed each day.
- f. Traffic and equipment: Kept off completed plies until adhesive has set.
- g. Wrapper and packaging materials: Not to be included in roofing system.
- h. Entrapped aggregate: Not permitted within new membrane. Its

discovery is sufficient cause for rejection.

- i. Ply shall never touch ply, even at roof edges, laps, tapered edge strips, and cants.
- j. Fit plies into roof drain rims; install lead flashing and finishing plies; secure clamping collars; install domes.
- k. Extend roofing membrane to top edge of cant at wall and projection bases.
- l. Cut out fishmouths/side laps which are not completely sealed; patch. Replace all sheets which are not fully and continuously bonded.
- m. Cold process adhesive heating:
 - i. An in-line heat exchange unit may be used to facilitate application.
 - 1. Maximum adhesive temperature: 100°F (38°C). Do not exceed the flash point of the adhesive.
 - ii. Heat exchange unit: Filled with heat transfer oil approved by equipment manufacturer.
 - iii. Follow operation procedures as recommended by equipment manufacturer.
- n. Insulation: Form continuous insulation joints over deck flange. Do not cantilever insulation edges over deck ribs. Minimum bearing surface: 1-1/2 inches (38 mm).

3.03 PREPARATION

- a. Protection:
 - i. Contractor shall be responsible for protection of property during course of work. Lawns, shrubbery, paved areas, and building shall be protected from damage. Repair damage at no extra cost to Owner.
 - ii. Provide at site prior to commencing removal of debris, a dumpster or dump truck to be located adjacent to building where directed by Owner.
 - iii. Roofing, flashings, membrane repairs, and insulation shall be installed and sealed in a watertight manner on same day of installation or before arrival of inclement weather.

- iv. At start of each work day drains within daily work area shall be plugged. Plugs to be removed at end of each work day or before arrival of inclement weather.
 - v. Preparation work shall be limited to those areas that can be covered with installed roofing material on same day and before arrival of inclement weather.
 - vi. Arrange work sequence to avoid use of newly constructed roofing for storage, walking surface, and equipment movement. Move equipment and ground storage areas as work progresses.
 - vii. At end of each working day, seal removal areas with water stops along edges to prevent water entry.
 - viii. Provide clean plywood walkways and take other precautions required to prevent tracking of aggregate/debris from existing membrane into new work area where aggregate/debris pieces can be trapped within new roofing membrane. Contractor shall instruct and police workmen to ensure that aggregate/debris is not tracked into new work areas on workmen's shoes or equipment wheels. Discovery of entrapped aggregate/debris within new membrane is sufficient cause for its rejection.
- b. Surface preparation:
- i. Remove: Existing roofing, insulation to roof deck.
 - 1. Area: As determined at site meeting.
 - ii. Sweep clean roof deck.

3.04 CARPENTRY

- i. Install 45 degrees and continuous wood cants (4 x 4's) at intersections of horizontal wood blocking and vertical flashing surfaces. Nail two (2) rows staggered. Spacing in any one (1) row shall not exceed 24 inches (610 mm). Within 8 feet (2.4 meter) of outside corners, spacing shall not exceed 12 inches (300 mm) in any one (1) row. Miter corners.
- a. Expansion joint(s):
- i. Install vertical blocking:
 - 1. Thickness: 2 inches (50 mm), nominal.
 - 2. Height: 8 inches (200 mm) above final surface of roofing.
 - ii. Install wood cants to blocking and substrate. Mechanically attach two (2) rows staggered to substrate and vertical blocking. Spacing in any one (1) row shall not exceed 24 inches (610 mm).

- b. Wall flashing(s) for non-wall-supported deck:
 - i. Install horizontal and vertical blocking.
 - 1. Vertical blocking:
 - a. Thickness: 2 inches (50 mm), nominal.
 - b. Height: 8 inches (200 mm) above final surface of roofing.
 - 2. Horizontal blocking:
 - a. Thickness: Equal to final insulation thickness, including tapered edge.
 - b. Width: 4 inches (10 mm), nominal.
 - ii. Mechanically attach horizontal blocking to deck. Fasteners shall be installed in two (2) rows staggered. Spacing in any one (1) row shall not exceed 24 inches (610 mm).
 - iii. Install wood cants to blocking. Nail two (2) rows staggered to horizontal and vertical blocking. Spacing in any one (1) row shall not exceed 24 inches (610 mm).
 - iv. Place compressible insulation between wall and vertical blocking to top of blocking.
 - v. Drape flexible vapor retarder over insulation and face of blocking.
- c. Equipment or sign support(s):
 - i. Install horizontal and vertical blocking at designated location.
 - 1. Vertical blocking:
 - a. Thickness: 6 inches (150 mm), nominal.
 - b. Height: 8 inches (200 mm) above surface of roofing.
 - 2. Horizontal blocking:
 - c. Thickness: Equal to final insulation thickness, including tapered edge.
 - d. Width: 12 inches (300 mm), nominal.
 - ii. Mechanically attach horizontal blocking to deck. Fasteners shall be installed in two (2) rows staggered. Spacing in any one (1) row shall not exceed 24 inches (610 mm).
 - iii. Install wood cants to blocking. Nail two (2) rows staggered to horizontal and vertical blocking. Spacing in any one (1) row shall not exceed 24 inches (610 mm).

- d. Metal sleeve and storm collar:
 - i. Mechanically attach wood blocking to deck at all storm collar locations. Minimum 2 fasteners per section.
 - ii. Offset blocking layers 12 inches (300 mm), weave corners.
 - 1. Blocking thickness: Equal to final insulation thickness including tapered edge.
 - 2. Blocking width: 4 inches (100 mm), nominal.
- e. Wood curb locations:
 - i. Mechanically attach wood blocking to deck at all wood curb locations. Minimum 2 fasteners per section.
 - ii. Offset blocking layers 12 inches (300 mm), weave corners.
 - 1. Blocking thickness: Equal to final insulation thickness.
 - 2. Blocking width: 4 inches (100 mm) nominal.
 - iii. Install wood cants to blocking. Nail two (2) rows staggered to horizontal and vertical substrates. Spacing in any one (1) row shall not exceed 24 inches (610 mm).
- f. Plumbing vents:
 - i. Mechanically attach wood blocking to structural deck at all plumbing vent locations; minimum 2 fasteners per section.
 - ii. Offset blocking layers 12 inches (300 mm); weave corners.
 - iii. Blocking thickness: 1-1/2 inches (38 mm) above final insulation thickness.
- g. Wood blocking fastening pattern:
 - i. Secure continuous wood blocking with mechanical fasteners attached in two (2) rows staggered to substrate.
- h. Parapet wall coping cap locations:
 - ii. Mechanically attach continuous wood blocking to top of parapet using ½" (13 mm) diameter anchor bolts spaced 4 feet (1.22 m) on center, with a minimum of 2 fasteners per section of wood blocking. Decrease anchor bolt spacing to two (2) feet (610 mm) on center in each direction 8 feet (2.44 m) from the corner. Countersink anchor bolts flush with blocking surface.
 - 1. Blocking thickness: 2 inches (50 mm) nominal.
 - 2. Blocking width: Flush with edges.

3.05 ROOF DECK REPAIRS

- a. Metal roof deck repairs:
 - i. Deck reattachment:

1. Mechanically reattach loose sections of deck to steel support members 12 inches (300 mm) o.c. (at every other rib) and 6 inches (150 mm) o.c. (at every rib) in roof corner and roof perimeter areas.
 2. Side laps: Mechanically fasten 18 inches (460 mm) o.c.
 3. Mechanically fasten steel deck to supporting member at each deck side lap, regardless of spacing.
 4. Overlap steel deck end laps 2 inches (50 mm) minimum. Mechanically attach at the above listed factors.
- ii. Deck replacement:
1. Remove defective metal decking. Examine supports. If unsound, contact owner immediately for future action.
 2. Install new metal decking in accordance with SDI, Design Manual for Composite Decks, Form Decks, Roof Decks.

3.06 THERMAL INSULATION

- A. Install tapered insulation system in pattern prescribed by manufacturer's shop drawings.
- B. Adhere second/top layer with a ribbon coverage of solvent free insulation adhesive at a rate of 1-1/2 gallons per 100 sq. ft. (0.61 L/m²). Immediately after placement, walk insulation boards into adhesive to achieve solid contact.
- C. Mechanically attach bottom layer of insulation to the deck.
- i. Fastener density: 1 every 3 sq. ft. (1 every 0.28 sq. meter.)
- D. Install additional fasteners to ensure insulation is firm under foot.
- E. Drive mechanical fasteners flush to top surface.
- F. Filler insulation requires 2 fasteners per piece minimum.
- G. Adhere second/top layer with a ribbon coverage of solvent free insulation adhesive at a rate of 1-1/2 gallons per 100 sq. ft. (0.61 L/m²). Immediately after placement, walk insulation boards into adhesive to achieve solid contact.
- H. Offset joints of second layer 6 inches (150 mm) in both directions from joints of base layer.

3.07 CRICKETS/SADDLES

- a. Install premanufactured crickets.
- b. Adhere crickets to substrate with solvent free insulation adhesive.

3.08 ROOF SYSTEM APPLICATION

- a. Install the following prior to application of the roofing system:
 - i. Wood blocking at roof edge, curbs, and penetrations.
 - ii. Cants at perimeter and around curbs.
 - iii. Thermal insulation.
- b. Install three (3) plies of ply sheet, shingle fashion. Overlap starter strips 26 inches (660 mm) with first ply, then overlap each succeeding ply 24-2/3 inches (630 mm). Place ply sheets to ensure water will flow over or parallel to, but never against exposed edges.
- c. Use 12, 24, 36 inch (305, 610, 910 mm) wide plies to start and finish roof membrane along roof edges and terminations.
- d. Immediately after installation, broom and/or roll ply sheet. Ensure complete and continuous seal and contact between adhesive and felts, including ends, edges and laps without wrinkles, fish mouths, or blisters. Broom/roller width: 34 inches (860 mm) minimum.
- e. Apply uniform and continuous pressure to exposed edge and end laps to ensure complete adhesion.
- f. Avoid walking on plies until adhesive has set.
- g. Overlap previous day's work 24 inches (610 mm).
- h. Lap ply membrane ends 4 inches (100 mm). Stagger end laps 3 feet (910 mm) minimum.
- i. Embed each ply in a uniform and continuous application of cold process interply adhesive. Interply application rate: 2-1/2 gallons per 100 sq. ft. (1.0 L/m²).

3.09 DAILY WATERSTOP/TIE-INS

- a. Remove embedded gravel/debris from top ply of felt along termination.
 - i. Width: 18 inches (460 mm).

- b. Adhere 12 and 18 inch (305 and 460 mm) wide ply sheets from exposed deck to existing roofing with a continuous 1/16 inch (1.6 mm) thick application of tie-off mastic. Glaze cut-off with surfacing mastic. Extend 18 inch (460 mm) wide felt 3 inches (80 mm) either side 12 inch (305 mm) felt.
- c. Install "deadman" insulation filler at insulation staggers.
- d. Extend roofing system at least 12 inches (305 mm) onto prepared area of adjacent roofing. Seal edge with 6 inches (150 mm) wide reinforcing membrane embedded between alternate courses of tie-off mastic.
- e. At beginning of next day's work remove temporary connection by cutting felts evenly along edge of existing roof system. Remove "deadman" insulation fillers.

3.10 MEMBRANE REPAIRS

- a. Unadhered felt edges or fishmouths:
 - i. Unadhered ply sheet within 2 inches (50 mm) or less from exposed edges:
 - 1. Cut away unadhered felts and remove dust and debris; dry.
 - 2. Apply asphalt mastic to seal.
- b. Unadhered ply sheet more than 2 inches (50 mm) in from the ply edge:
 - i. Cut away unbonded ply sheets until firmly laminated sheets are reached. Clean; dry.
 - ii. Reinforce and seal prepared area with reinforcing mesh embedded between alternate continuous applications of asphalt mastic.
- c. All defects shall be repaired using at least one additional ply in area being repaired.
- d. Use same membrane materials. Adhere repair materials in manner as specified for original membrane. Install surfacing to match existing surrounding area.

3.11 FLASHINGS

- a. General flashing requirements:
 - i. Elastomeric Flashing:
 - 1. Elastomeric sheeting width: Sufficient to extend at least 6 inches (150 mm) beyond toe of cant onto new roof.
 - 2. Adhere elastomeric sheeting completely to flashing surface, cant, and roofing with butyl based elastomeric flashing adhesive. After application of flashing adhesive, allow adhesive to remain open for 15 minutes minimum to flash off solvent prior to setting elastomeric sheeting into the flashing adhesive.
 - 3. Apply consistent pressure to entire surface of elastomeric sheeting using a steel hand roller to achieve full adhesion of the sheeting to the flashing substrate. Ensure complete bond and continuity without wrinkles or voids. Lap vertical sheeting ends 4 inches (100 mm).
 - 4. Seal bottom horizontal edges of elastomeric sheeting to the roof system with reinforcing membrane embedded in a base course of butyl based elastomeric flashing adhesive and a top course of modified bituminous mastic.
 - 5. Seal vertical laps of elastomeric sheeting with reinforcing membrane embedded in a base course of and top course of modified bituminous mastic.
 - ii. Two-Ply Stripping for metal flanges:
 - 6. Set flange in asphalt mastic. Seal flange with two (2) stripping plies embedded between alternate applications of stripping adhesive/bitumen. Extend first ply 4 inches (100 mm) beyond flange; second ply 2 inches (50 mm) beyond first ply.
- b. At wall flashings:
 - i. Install elastomeric base flashing described in general flashing requirements section.
 - ii. Secure top edge of flashing membrane to vertical substrate with termination bar secured 8 inches (200 mm) o.c. maximum.
 - iii. Wipe top of bar clean with metal cleaner. Prime metal surface to receive sealant with metal primer. Allow to dry.
 - iv. Caulk top of bar. Provide watershed. Tool neatly.
 - v. Fabricate and install new counterflashing.
 - vi. Wipe clean metal surfaces of flashing joint with metal cleaner. Prime metal joint surfaces with metal primer. Allow to

- f. At equipment/sign support(s):
 - i. Extend new roofing to top edge of cant. Nail 8 inches (200 mm) o.c. with spiral or annular shank nails, with a 1 inch (25 mm) cap.
 - ii. Install elastomeric base flashing described in general flashing requirements section. Extend base flashing over vertical blocking to locate a single piece flashing.
 - iii. Secure top edge of flashing membrane to substrate with termination bar secured 8 inches (200 mm) o.c. maximum.
 - iv. Fabricate and install one-piece counterflashing.
 - v. Mechanically fasten to vertical portion of curb with neoprene grommets screws 12 inches (305 mm) o.c.

- g. At wood curb flashings:
 - i. Remove mechanical equipment from curb.
 - ii. Install new roofing to top edge of cant. Nail 8 inches (200 mm) o.c. with spiral or annular nails, with a 1 inch (25 mm) cap.
 - iii. Install elastomeric base flashing described in general flashing requirements section.
 - iv. Secure top edge of flashing to substrate with termination bar; mechanically fasten 8 inches (20.3 cm) o.c. maximum.
 - v. Wipe top of bar clean with metal cleaner. Prime metal surface to receive sealant with metal primer. Allow to dry.
 - vi. Caulk top of bar. Provide watershed. Tool neatly.
 - 1. Fabricate and install counterflashing.
 - vii. Reinstall mechanical equipment onto curb. Refasten.

- h. At plumbing vents:
 - i. Wedge plumbing vent tight against deck.
 - ii. Install roofing system onto wood blocking.
 - iii. Apply 1/16 inch (1.6 mm) uniformly thick layer of asphalt mastic to surface receiving metal flange.
 - iv. Fabricate and install plumbing vent flashing from lead. Flange: 4 inches (100 mm) wide minimum; extend completely around periphery of vent flashing. Set flange into mastic. Neatly dress flange with wood block.
 - v. Prime metal flange with asphalt primer.
 - 1. Pipe outside diameter greater than 2 inches (50 mm): Bend lead inside pipe 1 inch (25 mm) minimum with pliers or rubber/plastic mallet; replace cracked lead.
 - 2. Pipe outside diameter 2 inches (50 mm) or less: Cut lead at vent top; fabricate and install integral lead cap.

- vi. Fabricate plumbing vent flashing from copper. Wrap iron and steel vent pipes with asphalt coated base sheet (ASTM D 4601) to prevent direct contact of metal with copper. Install copper plumbing vent flashing. Flange: 4 inches (100 mm) wide minimum; extend completely around periphery of vent flashing. Prime metal flange with asphalt primer. Set flange into mastic. Fabricate and install integral copper cap at vent top.
 - 3. Mechanically fasten plumbing vent to blocking, 3 inch (75 mm) o.c. staggered.
- vii. Install two (2) ply stripping for metal flanges as described in general flashing requirements section.
- i. At copings:
 - i. Installation of light metal parapet cap.
 - 1. Install wood blocking.
 - 2. Install continuous bent cleat on outside edge of wood blocking. Cleat shall be 1 gage heavier than coping cover. Lap ends 1 inch (25 mm). Nail 16 inches (400 mm).
 - 3. Install shims or beveled wood strips to provide inward slope to finished coping cap.
 - 4. Place a base sheet felt over top of parapet blocking. Extend down 2 inches (50 mm) minimum over edges.
 - 5. Fabricate and install coping cover. Connect coping sections with 1-1/4 inch (32 mm) high standing seam. Extend front and rear sides of cover 2 inches (50 mm) beyond wood blocking. Bend lower edges out 30 degrees maximum to form drip edge. Attach outside edge to continuous cleat with 3/4 inch (19 mm) lock. Attach inside edge to wood blocking 24 inches (610 mm) o.c. At corners, form standing seam and miter.
 - j. At metal sleeve and storm collar(s):
 - i. Apply 1/16 inch (1.6 mm) uniformly thick layer of asphalt mastic to surface receiving metal flange.
 - ii. Fabricate and install sleeve flashing. Height: 8 inches (200 mm). Flange width: 4 inches (100 mm). Flange to extend completely around flashing periphery. Solder all joints. Double solder vertical joints.
 - iii. Nail flange to wood blocking 3 inches (75 mm) o.c., staggered.
 - iv. Prime flange with asphalt primer.

- v. Install two (2) ply stripping described in general flashing requirements section.
 - vi. Fabricate storm collar with bolted connection. Cover sleeve flashing 3 inches (75 mm) minimum. Tighten bolts.
 - vii. Wipe clean top of storm collar and projection with metal cleaner. Prime surface with metal primer. Caulk projection/sheet metal interface. Provide watershed. Tool neatly.
- k. At roof drains:
- i. Install tapered edge strip around drain to create approximate 48 x 48 inch (1220 x 1220 mm) sump. Miter corners. Seal toe of tapered edge to drain rim with reinforcing membrane embedded between alternate courses of asphalt mastic.
 - ii. Install roofing system into sump and onto drain rim.
 - iii. Plug drain to prevent water entry until service connection is completed.
 - iv. Prime the bottom side of the lead flashing.
 - v. Apply 1/16 inch (1.6 mm) uniformly thick layer of asphalt mastic to surface receiving soft copper flashing.
 - vi. Set single piece lead flashing in mastic centered over drain; extend lead 6 inches (150 mm) beyond drain rim. Neatly dress lead with wood block.
 - vii. Clamp flashing collar to drain in bed of mastic.
 - viii. Neatly cut lead/felts within drain at rim. Lead to extend 1 inch (25 mm) into bowl.
 - ix. Prime lead with asphalt primer.
 - x. Fabricate a 1" x 4" (25 mm by 100 mm) gravel retainer in a 36" (0.914 m) square around the drain bowl. Set gravel retainer in asphalt mastic.
 - xi. Install two (2) ply stripping described in general flashing requirements section. Stripping shall not extend under clamping ring.
 - xii. For working drains, remove drain plug upon completion of work each day.

3.12SURFACING TREATMENT ON FLASHINGS

- a. Coat elastomeric flashing with 2 coats of VOC compliant aluminized heat reflective coating applied at an approximate rate of 130 sq. ft. per gallon (3.2 m²/L) per coat.

3.13 SURFACING APPLICATION

- a. Roof surfacing:
 - i. Prior to application of surface treatment system, contractor shall inspect roof with manufacturer's representative.
 - ii. Over entire roof surface spray apply uniform and continuous flood coat of cold process surfacing adhesive.
 - 6. Coverage rate: 5 gallons per 100 sq. ft. \pm 1/2 gallon per 100 sq. ft. ($2.0 \text{ L/m}^2 \pm 0.20 \text{ L/m}^2$).
 - iii. Immediately broadcast minimum 500 lbs./100 sq. ft. (24.5 kg/m^2) of new, clean roofing gravel. Cover flood coat material completely.

3.14 WALKWAYS

- a. Install walkway panels according to roof plan.
 - i. Adhere to roofing in a spot application of asphalt mastic.

3.15 ADJUSTING AND CLEANING

- a. Repair of deficiencies:
 - i. Installations of details noted as deficient during final inspection must be repaired and corrected by applicator, and made ready for reinspection, within five (5) working days.
- b. Clean-up:
 - i. Immediately upon job completion, roof membrane and flashing surfaces shall be cleaned of debris.
 - ii. Clean gutters and downspouts of debris.

WARREN WOODS PUBLIC SCHOOLS
POHI TOILET ROOM RENOVATIONS
TOWER HIGH SCHOOL

131480

MAY 17, 2013

Rep Name: _____

Phone/FAX: _____

DATE: _____

PROJECT: _____

CONTRACTOR: _____

PRE-FINAL INSPECTION CHECKLIST

The following items are to be checked and initialed by superintendent/foreman and the list the faxed to manufacturer's representative prior to calling for any PRE-SURFACING INSPECTION.

- _____ Termination Bar: Reinforced flashing is sandwiched with gasket tape between the wall and the top edge of reinforced flashing. Termination bar is to be mechanically fastened 8 inches on center.
- _____ Round roof penetrations, i.e., pipes, supports, etc. Gasket tape, stainless steel clamps, caulking, metal umbrellas are installed.
- _____ Fan housings, exhaust units and equipment on small curbs have been secured with correct screw fasteners and washers. Housings, duct work, and equipment have been cleaned of all asphalt marks/overspray, or painted.
- _____ Roof Drains: New bolts are in placed and tight. Clamping rings and rim cleaned, drains tested, dome cover in place. Sump installed.
- _____ Three (3) coursing is completed at all reinforced elastomeric flashing terminations to the roof membrane. Five coursing or targets are completed at all metal flanges (gravel stops, lead flanges, pitch pans, etc.). There shall be no reinforcing fabric or membrane showing through mastic.
- _____ All flanges properly secured to deck with appropriate fasteners nailed 3" on center and staggered.
- _____ Caulk outside of the perimeter of thru-wall drains/scuppers.
- _____ Wood blocking and walkpads have been installed under all pipe and conduit runs on the roof, including conduit clamps to blocking. Clamps to be loose fitting.

- ____ Mastic, asphalt, and/or adhesive is cleaned off all pipes, conduits, metal surfaces, penetrations, perimeter metal and walls, or completely painted.
- ____ Gravel stop, coping, or perimeter metal has been properly butted and with cover plates, interlocking laps, and metal fits tightly. The face of the gravel stop metal has been cleaned or painted to match original if specified.
- ____ Gutters have been cleaned out and coated with rust prohibitive paint or coating (if specified). Strainers have been installed at all downspout locations. Downspouts have been cleaned out and water flows through. Downspouts have be secured.
- ____ Gravel surface has been neatly dressed.
- ____ Sheet metal corners installed and properly secured where metal flashing has been broken.
- ____ Walk pads have been installed at all service areas of roof top equipment, roof hatch, roof ladders, doors, etc. and in areas required per specifications.
- ____ The grounds surrounding the building or project area and the setup areas have been cleaned and all asphalt has been cleaned from grounds. All debris and **ROOFING NAILS** have been cleaned up and disposed of.
- ____ The specifications, scope of work, and any special notes or applications have been reviewed and completed to ensure all items have been addressed.
- ____ Pitch pans properly filled with grout, specified mastic, and sheet metal covers installed and sealed.
- ____ Field deficiencies have been repaired, such as dry laps, fishmouths, blisters, torn felts, etc.
- ____ All A/C duct seams sealed as specified.

THANK YOU FOR YOUR COOPERATION!

FOREMAN _____

SUPERINTENDENT _____

DATE _____

NOTE: FINAL INSPECTION WILL BE SCHEDULED UPON COMPLETION OF FORM!!!

WARREN WOODS PUBLIC SCHOOLS
POHI TOILET ROOM RENOVATIONS
TOWER HIGH SCHOOL

131480

MAY 17, 2013

Selected Details

- 303 Equipment/Sign Support
- 310 Plumbing Vent
- 317 Wood Curb Detail
- 318 Stack Flashing
- 321 Temporary Tie-Ins
- 330 Curb for Exhaust Fan Unit

SECTION 07600 - FLASHING AND SHEET METAL

PART ONE - GENERAL

1.01 WORK INCLUDED

- A. Counterflashings for Built Up Coal Tar roofing system

1.02 RELATED WORK

- A. Section 06100 - Carpentry
- B. Section 07512 - Built Up Coal Tar Roofing

1.03 QUALITY ASSURANCE

- A. Requirements of current edition of "Architectural Sheet Metal Manual" published by Sheet Metal and Air Conditioning Contractors' National Association, Inc. ("SMACNA") shall form a part of these Specifications except as otherwise specified or shown on Drawings.

1.04 SUBMITTALS

- A. The Contractor shall submit a list of materials and description of installation methods proposed for this work for review by the Architect.
- B. Shop drawings and color samples will be required for metal copings in accordance with the General Conditions and Supplementary General Conditions. Fabrication of the work shall not commence until shop drawings bearing Contractor's final corrections have been reviewed and returned by the Construction Manager and Architect.

1.05 WARRANTY/GUARANTEE

- A. The Contractor shall furnish a written Guarantee warranting all sheet metal including metal flashing to remain serviceable and in good condition for two (2) years from date of final acceptance of the building and to promptly repair and place in good condition without additional expense to the Owner any sheet metal and metal flashings which become defective within that period.
- B. Manufacturer's Standard Warranty: Warranted materials shall be free of defects in material and workmanship for five years after shipment. If, after inspection, the manufacturer agrees that materials are defective, the manufacturer shall, at their option, repair or replace them. For decorative finish warranty, consult manufacturer.

PART TWO - PRODUCTS

2.01 MATERIALS

- A. Exposed and concealed metal flashings, including metal counterflashings at parapets and metal drip edge for concealed fabric flashing shall be of soft stainless steel cold rolled sheet or strip of Type 302/304 alloy having a 2-D dull fully annealed finish, which shall have at least its exposed portions custom color painted after fabrication in a color to match adjoining metal work as selected by the Owner's representative.
 - 1. Counterflashing at parapets shall be two-piece type, with flashing of at least 26 gauge stainless steel having a receiver of at least 28 gauge stainless steel.

PART THREE - EXECUTION

3.01 INSTALLATION

- A. Provide counterflashing for all base flashings of the Built Up Coal Tar roofing system. Turn metal down at least four inches over upper portion of such base flashings. Provide flashings at roof curbs and where else required to make roofing and sheet metal watertight.
- B. Insulate sheet metal from other materials using roofing felt, roofer's mastic, bituminous paint or other materials acceptable to the Architect.

END OF SECTION 07600

SECTION 07840 - FIRESTOPPING

PART I - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this section.

1.02 DESCRIPTION OF WORK:

- A. Provide labor and materials necessary for complete installation of firestopping materials and systems. Section includes firestopping for the following:
 - 1. Penetrations through fire resistance rated walls and roof construction including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.
 - 2. Penetrations through fire resistance rated walls and partitions including both empty openings and openings containing cables, pipes, ducts, conduits and other penetrating items.
 - 3. Penetrations through smoke barriers and construction enclosing compartmentalized area involving both empty openings and openings containing penetrating items.
 - 4. Sealant joints in fire resistance rated construction.

1.03 SUBMITTALS:

- A. Product Data: Manufacturer's specifications and technical data for each material including the composition and limitations, documentation of UL or other nationally recognized independent testing laboratories firestop systems to be used and manufacturer's installation instructions.
 - 1. Submit material safety data sheets (MSDS) provided with product delivered to jobsite.

- B. Product certificates signed by manufacturers of firestopping products certifying that their products and installation comply with specified requirements. Certification shall be signed by the Installer.

1.04 QUALITY ASSURANCE:

- A. Conform to applicable governing codes, including local governing authorities, but not limited to the following:
 - 1. 2009 Michigan Building Code
 - 2. NFPA 101 1997 and current editions
- B. Meet requirements of ASTM E814-02 or UL 1479-94 tested assemblies that provide a fire rating equal to that of construction being penetrated and other ASTM Standards as applicable for the installation.
 - 1. ASTM E84-04 "Test Method for Surface Burning Characteristics of Building Materials".
 - 2. ASTM E119-00 "Test Methods for Fire Tests of Building Construction and Materials".

PARTS 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with through-penetration firestop systems (XHEZ) listed in Volume II of the UL Fire Resistance Directory, provide products by one of the following:
 - 1. Hilti Construction Chemicals, Tulsa, OK
 - 2. Specified Technologies Inc. (STI) Sommerville, NJ
 - 3. 3M Fire Protection Products, St. Paul, MN
 - 4. The REctorseal Corp., Houston, TX
 - 5. Tremco, Inc. Beachwood, OH

2.02 FIRESTOPPING, GENERAL

- A. Compatibility: Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by firestopping manufacturer based on testing and field experience.

1. All materials shall comply with ASTM E814-02 or E119-00 (UL 1479-94, with revisions through August 2000) and shall be manufactured of non-toxic, non-hazardous, asbestos free materials and unaffected by water or moisture when cured.
 2. Primers: Conform to manufacturer's recommendations for primers required for various substrate and conditions.
 3. Backup materials: Backup materials, supports, and anchoring devices shall be provided as required by UL testing.
- B. Accessories: Provide components for each firestopping system that are needed to install fill materials and to comply with "System Performance Requirements" in Part 1. Use only components specified by the firestopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire resistance rated system. Accessories include but are not limited to the following items:
1. Permanent forming/damming/backing materials must be noncombustible and may include the following:
 - a. Semirefractory fiber (mineral wool) insulation.
 - b. Sealants used in combination with other forming/damming materials to prevent leakage of fill materials in liquid state.
 - c. Joint fillers for joint sealants.
 2. Temporary forming materials.
 3. Substrate primers.
 4. Collars.
 5. Steel sleeves.

2.03 FIRE STOPPING, MATERIALS

- A. Use only firestopping products that have been UL 1479-94 (with revisions through August 2000) or ASTM E814 tested for specific fire rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements and fire rating involved for each separate instance.
- B. For penetrations by noncombustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following materials are acceptable:

1. Hilti CP 601s Elastomeric Firestop Sealant
 2. STI SpecSeal Sealant SSS Intumescent Sealant
 3. 3M Fire Barrier CP25WB+ caulk
 4. The RectorSeal Corp. Metacaulk 1000, 950, 835+, Metacaulk Putty and Putty Pads, & Metacaulk Fire Rated Mortar.
 5. Fyre-Sil, Tremco, Inc.
 6. Biofireshield K10 and K2 Mortar, Biostop 500+, Biootherm 100/22200 & Biostop Putty, (The RectorSeal Corp.)
- C. For penetrations by combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe (closed piping systems) the following materials are acceptable:
1. Hilti FS One Intumescent Firestop Sealant
 2. STI Intumescent Wrap Strip SSW Series
 3. 3M Fire Barrier FS-195+ Wrap/Strip
 4. The Rectorseal Corp. Metacaulk Wrap Strip, Metacaulk Pipe Collars, Metacaulk 1000, 950 & 835+.
 5. Biostop Intumescent Wrap Strip, Collar, and Biostop 500+ (The Restorseal Corp.)
- D. For large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways, the following materials are acceptable:
1. Hilti CP637 Trowelable Firestop Compound
 2. STI SpecSeal Series Mortar SSM Series or SSP Putty and Putty Pads.
 3. 3M Fire Barrier CS-195+ Composite Sheet
 4. The Rectorseal Corp. Metacaulk Fire Rated Mortar
 5. Tremco: Tremstop Fire Mortar
 6. Biofireshield K-10 & K2 mortar (The Rectorseal Corp.)
- E. For fire-rated construction joints and other gaps with movement, the following materials are acceptable:
1. Hilti CP 601s Elastomeric Firestop Sealant
 2. STI Pen 300 Silicone Sealant
 3. 3M 2000 Silicone Sealant
 4. The Rectorseal Corp. Metacaulk 1000 & 1100
 5. Fyre-Sil, Tremco, Inc.
 6. Biofireshield, Biostop 700, Biostop 500+ (The Rectorseal Corp.)

- F. Provide a firestopping system with an "F" rating as determined by UL 1479-94 (with revisions through August 2000) or ASTM E814-02 which is equal to the time rating of construction being penetrated.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of firestopping. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Surface Cleaning: Clean out openings and joints immediately prior to installing firestopping to comply with recommendations of firestopping manufacturer and the following requirements:
 1. Remove all foreign materials from surfaces of opening and joint substrates and from penetrating items that could interfere with adhesion of firestopping.
 2. Clean opening and joint substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestopping. Remove loose particles remaining from cleaning operation.
 3. Remove laitance and form release agent from concrete.

3.03 INSTALLING THROUGH-PENETRATION FIRESTOPS

- A. General: Comply with the manufacturer's installation instructions and drawings pertaining to products and applications indicated.
- B. Install forming/damming materials and other accessories of types required to support fill materials during their application and in the position needed to produce the cross sectional shapes and depths required to achieve fire ratings of designate through-penetration firestop systems. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

- C. Install fill materials for through-penetration firestop systems by proven techniques to produce the following results:
 - 1. Completely fill voids and cavities formed by openings, forming materials, accessories and penetrating items.
 - 2. Apply materials so they contact and adhere to substrate formed by openings and penetrating items.
 - 3. For fill materials that will remain exposed after completing work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.04 INSTALLING FIRE RESISTIVE JOINT SEALANTS

- A. General: Comply with the manufacturer's installation instructions and drawings pertaining to products and application indicated.

3.05 CLEANING

- A. Clean off excess fill materials and sealant adjacent to openings and joints as work progresses by methods and with cleaning materials approved by manufacturers of firestopping products and of products in which opening and joints occur.

END OF SECTION 07840

SECTION 07910 - JOINT FILLERS AND GASKETS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this Section.

1.02 DESCRIPTION OF WORK:

- A. The extent of each type of joint filler and gasket work is indicated on the drawings and by provisions of this section, and is hereby defined to include required fillers and gaskets not specified in other sections of these specifications.
- B. The required applications of joint fillers and gaskets include, but are not necessarily limited to, the following general types and locations:
 - 1. Joint fillers around penetrations of equipment and services through walls, floors and roofs.

1.03 SUBMITTALS:

- A. Product Data:
 - 1. Submit manufacturer's specifications, installation instructions and recommendations for each type of material required.
- B. Samples:
 - 1. Submit three, 12 inches long samples of each joint filler or gasket.

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL:

- A. Size and Shape: Provide sizes and shapes of units as shown or, if not shown, as recommended by manufacturer for joint size and condition shown. Where joint movement is a factor in a determination of size, consult with Architect to determine nature and magnitude of anticipated joint movements for the temperature and condition of project at time of installation.

- B. Compressibility: Specified hardness and compressibilities are intended to establish requirements for normal or average conditions of installation and use. Where a range of hardness or compressibility is available for a product, comply with manufacturer's recommendations for specific condition of use.
- C. Color: Provide each concealed material in manufacturer's standard color which has best overall performance characteristics for application shown. Provide exposed materials in black, except where another color is indicated.
- D. Compatibility: Before purchase of each filler or gasket material, confirm that it is compatible with substrate, sealants and other materials in joint system.
- E. Adhesives: Pressure sensitive adhesives, compatible with each material in joint system may be applied (at installer's option) to one face of joint fillers and gaskets to facilitate installation and permanent anchorage. Do not allow adhesives to contaminate sealant bond surface (if any) in joint system.

2.02 CONCRETE CONTROL/EXPANSION JOINT FILLERS:

- A. Bituminous and Fiber Joint Filler:
 - 1. Provide resilient and non-extruding type premolded bituminous impregnated fiberboard units complying with ASTM D 1751, FS HH-F-341, Type 1 and AASHO M 213.
 - 2. Provide one of the following products:
 - a. Flexcell-Knight-Celotex Corporation
 - b. Expansion-Joint Filler; BASF/Sonneborn
 - c. FF-14. Asphalt Fiber-Board; Progress Unlimited
 - d. Fibre Expansion Joint; W.R. Meadows, Inc.
 - e. Conflex Fiber Expansion Control Joint Filler, JD Russell

2.03 CELLULAR/FOAM EXPANSION JOINT FILLERS:

- A. Closed-Cell PVC Joint Filler:
 - 1. Provide flexible expanded polyvinyl chloride complying with ASTM D 1667. Grade VE 41 BL (3.0 psi compression deflection); except provide higher compression deflection grades as may be necessary to withstand installation forces.

2. Provide one of the following products:

- a. FF2 PVC: Progress Unlimited, Inc.
- b. Vinyl "U" 1000 Series: Williams Products, Inc.

2.04 GASKETS:

A. Molded Neoprene Gasket:

- 1. Provide extruded neoprene or EPDM gaskets complying with ASTM D 2000, Designation 2BC 415 to 3BC 620, black (40 to 60 Shore A durameter hardness); of the profile shown or, if not shown, as required by the joint shape, size and movement characteristics to maintain a watertight and airtight seal.
- 2. Provide products by one of the following manufacturers:
 - a. D.S. Brown Company
 - b. Hohmann & Barnard, Inc.
 - c. Kirkhill Rubber Company
 - d. Progress Unlimited, Inc.
 - e. JD Russell
 - f. Williams Products, Inc.

2.05 MISCELLANEOUS MATERIALS:

A. Oakum Joint Filler:

- 1. Provide untreated hemp or jute fiber rope, free of oil, tar and other compounds which might stain surfaces, contaminate joint walls or not be compatible with sealants.

B. Fire-Resistant Joint Filler:

- 1. Glass fiber or other inorganic non-combustible fiber formed with minimum of binder into resilient joint filler strips or blankets of sizes and shapes indicated, recommended by manufacturer specifically for increasing fire resistance or endurance of joint systems of type indicated, for service temperatures up to 2300 degrees F, 80% (min.) recovery 50% compression.

PART 3 - EXECUTION

3.01 INSPECTION:

- A. Installer must examine joint surfaces of units to receive fillers or gaskets and conditions under which the work is to be performed and notify the General Contractor, in writing, of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.02 INSTALLATION:

- A. Comply with manufacturer's instructions and recommendations for installation of each type of joint filler or gasket required, unless more stringent requirements are shown or specified.
- B. Set units at proper depth of position in joint to coordinate with other work, including installation of bond breakers, backer rods, and sealants. Do not leave voids or gaps between ends of joint filler units.
- C. Recess exposed edges or faces of gaskets and exposed joint filler slightly behind adjoining surfaces, unless otherwise shown, so that compressed units will not protrude from joints.
- D. Bond ends of gaskets together with adhesive or by means as recommended by manufacturer to ensure continuous watertight and airtight performance. Miter-cut and bond ends at corners except where molded corner units are provided.

END OF SECTION 07910

SECTION 07920 - SEALANTS AND CAULKING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this Section.

1.02 DESCRIPTION OF WORK:

- A. The extent of each type of sealant and caulking work is indicated on the drawings and by provisions of this section.
- B. The required applications of sealants and caulking include, but are not necessarily limited to, the following general locations:
 - 1. Flashing reglets and retainers.
 - 2. Masonry control joints, interior.
 - 3. Interior sound-sealed and air-sealed joints.
 - 4. Flooring joints.
 - 5. Isolation joints, between structure and other elements.
 - 6. Joints at penetrations of walls, decks and floors by piping and other services and equipment.
 - 7. Joints between items of equipment and other construction.
 - 8. Joints between dissimilar materials.

1.03 QUALITY ASSURANCE:

- A. Manufacturers: Firms with not less than 5 years of successful experience in production of types of sealants and caulking compounds required for this project.
 - 1. Obtain elastomeric sealants from a manufacturer which will, upon request, send a qualified technical representative to the project site for purpose of advising installer on proper procedures for use of products.
- B. Installer: A firm with a minimum of (5) five years of successful experience in application of types of materials required.

1.04 SUBMITTALS:

A. Product Data:

1. Submit manufacturer's specifications, recommendations and installation and instructions for each type of sealant, caulking compound and associated miscellaneous material required.

B. Samples:

1. Submit three, 12" long samples of each color required (except black) for each type of sealant and caulking compound exposed to view. Install sample between two strips of material similar to or representative of typical surfaces where compound will be used, held apart to represent typical joint widths.

1.05 JOB CONDITIONS:

- A. Pre-Installation Meeting: At General Contractor's direction, installer, sealant manufacturer's technical representative, and other trades involved in coordination with sealant work shall meet with General Contractor at project site to review procedures and time schedule proposed for installation of sealants in coordination with other work. Review each major sealant application required on project.

- B. Weather Conditions: Do not proceed with installation of sealants under adverse weather conditions, or when temperatures are below or above manufacturer's recommended temperature range for installation. Proceed with the work only when forecasted weather conditions are favorable for proper cure and development of high early bond strength. Where joint width is affected by ambient temperature variations, install elastomeric sealants only when temperatures are in lower third of the manufacturer's recommended installation temperature range, so that sealant will not be subjected to excessive elongation and bond stress at subsequent low temperatures. Coordinate time schedule with the General Contractor to avoid delay of project.

- C. Statement of Non-Compliance: Where it is necessary to proceed with installation of sealants or caulking compound under conditions which do not fully comply with requirements (because of time schedule or other reasons which the General Contractor determines to be crucial to project), prepare written statement for Owner's record (with copy to Architect) indicating the

nature of non-compliance, reasons for proceeding, precautionary measures taken to ensure best possible work and names of individuals concurring with decision to proceed with installation.

1.06 SPECIAL PROJECT WARRANTY (GUARANTEE):

- A. Sealant Warranty: Provide written warranty, signed by the contractor/installer, agreeing to, within warranty period of 10 years (or maximum warranty provided by manufacturer for polyurethane sealants) after date of substantial completion, replace/repair defective materials and workmanship defined to include: Instances of significant leakage of water or air; failures in joint adhesion, material cohesion, abrasion resistance, strain resistance or general durability; failure to perform as required and the general appearance of deterioration in any other manner not clearly specified in manufacturer's published product literature as an inherent characteristic of the sealant material. Warranty includes responsibility for removal and replacement of other work (if any) which conceals or obstructs the replacement of sealants.

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL:

- A. Colors: Provide black or other natural color where no other standard or custom color is available. Where material is not exposed to view, provide manufacturer's standard color which has best overall performance characteristics for application shown.
 - 1. Provide manufacturer's standard colors as selected by Architect from manufacturer's standard colors.
- B. Hardnesses shown and specified are intended to indicate general range necessary for overall performance. Consult manufacturer's technical representative to determine actual hardness recommended for conditions of installation and use. Upon request, Architect will furnish information concerning anticipated joint movement related to actual joint width and installation temperature. Except as otherwise indicated or recommended, provide compounds within the following range of hardness (Shore A, fully cured, at 75 degrees F.).

1. 5 to 20 for high percentage of movement and minimum exposure to weather and abrasion (including no exposure to vandalism).
 2. 15 to 35 for moderate percentage of movement and moderate exposure to weather and abrasion.
 3. 30 to 60 for low percentage of movement and maximum exposure to weather and abrasion (including foot traffic on horizontal joints).
- C. Modulus of Elasticity: For joints subjected to movement, either thermal expansion or dynamic movement, select sealants from among available variations which have lowest modulus of elasticity which is consistent with exposure to abrasion or vandalism. For horizontal joints subject to traffic, select sealants with high modulus of elasticity as required to withstand indentation by stiletto heels. Comply with manufacturer's recommendations where no other requirements are indicated.
- D. Compatibility: Before selection and purchase of each specified sealant, investigate its compatibility with joint surfaces, joint fillers and other materials in joint system. Provide only materials (manufacturer's recommended variation of specified materials) which are known to be fully compatible with actual installation conditions as shown by manufacturer's published data or certification.

2.02 SEALANTS:

- A. One Part Elastomeric Sealant (Silicone)
1. One component elastomeric sealant, complying with ASTM C 920, Class 25, Type NS (nonsag), unless Type S (self-leveling) recommended by manufacturer for the application shown.
 - a. Acceptable Standard
 1. "Pecora 864 Architectural Silicone Sealant; Pecora Corp.
 2. Dow Corning 791; Dow Corning Corp.
 3. Silpruf; General Electric
 4. Omniseal; Sonneborn Building Products, Inc.
 5. Spectrem 2; Tremco Mfg. Co.
 6. Sikasil WS 295; Sika Corp.

2. One-Component mildew resistant silicone sealant:
(Around countertops and backsplashes and other wet interior locations).
 - a. Acceptable Standard
 1. Rhodorsil 6B white; Rhone-Poulenc Inc.
 2. Dow Corning 786; Dow Corning Corp.
 3. Sanitary 1700; General Electric
 4. Sikasil GP; Sika Corp.
 3. One Component high movement joints (+100/-50):
Where locations of high movement are indicated.
 - a. Dow Corning 790; Dow Corning Corp.,
 - b. Spectrem 1; Tremco
 - c. Sikasil WS 290; Sika Corp.
- B. Elastomeric Sealant (Polyurethane)
 1. One component polyurethane sealant, complying with ASTM C 920, Type S, Grade NS, Class 25 (nonsag).
 - a. Acceptable Standard
 1. Sonolastic NP 1; Sonneborn Building Products Inc.
 2. Dymonic; Tremco Mfg. Co.
 3. Dynatrol I; Pecora Corp.
 4. Vulkem 921; Mameco
 5. CS 2130; Hilti
 6. Sikaflex 1A; Sika Corp.
 7. Sikaflex 15LM; Sika Corp.
 2. Two Component polyurethane sealant, complying with ASTM C 920, Type M, Grade NS, Class 25 (nonsag).
 - a. Acceptable Standard
 1. Sonolastic NP 2; Sonneborn Building Products Inc.
 2. Dymeric; Tremco Mfg. Co.
 3. Dynatrol II; Pecora Corp.
 4. Vulkem 922; Mameco
 5. Sikaflex 2cNSEZ; Sika Corp.

- C. One-part self-leveling polyurethane sealant (for traffic areas).
 - 1. One Component polyurethane self-leveling sealant, complying with ASTM C 920, Type S, Grade P, Class 25.
 - a. Acceptable Standard
 - 1. Sonolastic SL 1; Sonneborn Building Products Inc.
 - 2. NR-201 Urexpan; Pecora Corp.
 - 3. Vulkem 45; Mameco
 - 4. Sikaflex 1cSL; Sika Corp.
 - 2. Two-component polyurethane self-leveling sealant, complying with ASTM C 920, Type M, Grade P, Class 25.
 - a. Acceptable Standard
 - 1. Sonolastic SL 2; Sonneborn Building Products Inc.
 - 2. NR-200 Urexpan; Pecora Corp.
 - 3. Vulkem 245; Mameco
 - 4. THC900/THC901; Tremco
 - 5. Sikaflex 2cSL; Sika Corp.
- D. Security Sealant (Polyurethane)
 - 1. One component or two component polyurethane sealant, complying with ASTM C 920, Grade NS, Class 12.5, with a Shore A Hardness of 55.
 - a. Acceptable Standard
 - 1. Dynaflex; Pecora Corp.
 - 2. Ultra; Sonneborn Building Products, Inc.

2.03 CAULKING COMPOUNDS:

- A. Caulking Compounds: (Acrylic Latex Sealant)
 - 1. Latex rubber modified, acrylic emulsion polymer sealant compound; manufacturer's standard, one part, nonsag, mildew resistant, acrylic emulsion sealant complying with ASTM C 834, formulated to be paintable and recommended for exposed applications on interior locations involving joint movement of not more than plus or minus 5 percent.
 - 2. Acceptable Standard
 - a. Sonolac, Sonneborn Building Products Inc.
 - b. Acrylic Latex Caulk 834, Tremco Inc.
 - c. Acrylic Latex Caulk with Silicone, DAP
 - d. AC-20, Pecora Corp.

2.04 MISCELLANEOUS MATERIALS:

- A. Joint Cleaner: Provide type of joint cleaning compound recommended by sealant or caulking compound manufacturer, for joint surfaces to be cleaned.
- B. Joint Primer/Sealer: Provide type of joint primer/sealer recommended by sealant manufacturer, for joint surfaces to be primed or sealed.
- C. Bond Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer, to be applied to sealant-contact surfaces where bond to substrate or joint filler must be avoided for proper performance of sealant. Provide self-adhesive tape where applicable.
- D. Sealant Backer Rod: Compressible rod stock polyethylene foam, polyethylene jacketed polyurethane foam butyl rubber foam, neoprene foam or other flexible, permanent, durable non-absorptive material as recommended for compatibility with sealant by the sealant manufacturer.
- E. Provide size and shape of rod which will control joint depth for sealant placement, break bond of sealant at bottom of joint, form optimum shape of sealant bead on back side, and provide a highly compressible backer to minimize possibility of sealant extrusion when joint is compressed.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. The installer must examine joint surfaces, backing and anchorage of units forming sealant rabbet and condition under which sealant work is to be performed and notify the General Contractor in writing of conditions detrimental to proper completion of the work and performance by sealants. Do not proceed with sealant work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.02 SELECTION OF MATERIAL

- A. Caulking compounds shall be used for interior nonmoving joints and at locations indicated.

- B. One component elastomeric silicone sealants shall be used at exterior and interior joints where thermal or dynamic movement is anticipated including, but not limited to, the following locations:
1. Metal to metal joints.
 2. Sheet metal flashing, coping, preformed metal caps, fascias, extenders, trim and panels.
- C. One or two component elastomeric polyurethane sealants shall be used at exterior and interior joints where weatherproofing or waterproofing is required and at exterior joints between dissimilar materials including, but not limited to, the following locations:
1. Expansion and control joints.
 2. Exterior side of hollow metal frames to adjacent materials.
 3. Lintels and shelf angles to masonry construction.
 4. Vertical interior expansion joints and horizontal interior control joints and expansion joints in the building.
 5. Sealant in pipe sleeves where materials must perforate the floor slab.
 6. Perimeter of floor slabs which abut vertical surfaces.
 7. Exterior joints between dissimilar materials where the joining of the two surfaces leaves a gap between the meeting materials or components as may be dictated by the various methods of construction to make watertight.
 8. Exterior locations which are noted "caulked" or "sealant" and not specifically listed herein or included in the work of other sections of the Specifications.
 9. Interior joints between dissimilar materials where the joining of the 2 surfaces leave a gap between the meeting materials and components.
- D. One or two part self-leveling polyurethane sealants shall be used for interior horizontal joints subject primarily to pedestrian traffic.
- E. Security sealant shall be used in vertical control joints in the interior side of building.

3.03 JOINT SURFACE PREPARATION:

- A. Clean joint surfaces immediately before installation of sealant or caulking compound. Remove dirt, insecure coatings, moisture and other substances which would interfere with bond of sealant or caulking compound.
- B. For elastomeric sealants, do not proceed with installation of sealant over joint surfaces which have been painted, lacquered, waterproofed or treated with water repellent or other treatment or coating unless a laboratory test for durability (adhesion), in compliance with paragraph 4.3.9. of FS TT-S-00227 has successfully demonstrated that sealant bond is not impaired by coating or treatment. If laboratory test has not been performed or shows bond interference, remove coating or treatment from joint surfaces before installing sealant.
- C. Etch concrete and masonry joint surfaces to remove excess alkalinity, unless sealant manufacturer's printed instructions indicate that alkalinity does not interfere with sealant bond and performance. Etch with 5% solution of muriatic acid; neutralize with dilute ammonia solution, rinse thoroughly with water and allow to dry before sealant installation.
- D. Roughen joint surfaces on vitreous coated and similar non-porous materials, where sealant manufacturer's data indicated lower bond strength than for porous surfaces. Rub with fine abrasive to produce a dull sheen.

3.04 INSTALLATION:

- A. Comply with sealant manufacturer's printed instructions except where more stringent requirements are shown or specified and except where manufacturer's technical representative directs otherwise.
- B. Prime or seal joint surfaces where shown or recommended by sealant manufacturer. Do not allow primer/sealer to spill or migrate onto adjoining surfaces.
- C. Install sealant backer rod for liquid sealants, except where shown to be omitted or recommended to be omitted by sealant manufacturer for the application shown.
- D. Install bond breaker tape where shown and where required by manufacturer's recommendations to ensure that elastomeric sealants will perform properly.

- E. Employ only proven installation techniques, which will ensure that sealants will be deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of joint bond surfaces equally on opposite sides. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and a vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.

- F. Install sealants to depths as shown or if not shown as recommended by sealant manufacturer but within the following general limitations, measured at center (thin) section of bead.
 - 1. For slabs and similar joints sealed with elastomeric sealants and subject to traffic and other abrasion and indentation exposures, fill joints to a depth equal to 75% of joint width and neither more than 5/8" deep nor less than 3/8" deep.
 - 2. For normal moving joints sealed with elastomeric sealants, but not subject to traffic, fill joints to a depth equal to 50% of joint width, but neither more than 1/2" deep nor less than 1/4" deep.
 - 3. For joints sealed with non-elastomeric sealants and caulking compounds, fill joints to a depth in the range of 75% to 125% of joint width.

- G. Spillage: Do not allow sealants or compounds to overflow or spill onto adjoining surfaces or to migrate into voids of adjoining surfaces including exposed aggregate panels and similar rough textures. Use masking tape or other precautionary devices to prevent staining of adjoining surfaces but either primer/sealer or the sealant/caulking compound.

- H. Remove excess and spillage of compounds promptly as the work progresses. Clean adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage without damage to adjoining surfaces or finishes.

3.05 CURE AND PROTECTION:

- A. Cure sealants and caulking compounds in compliance with manufacturer's instructions and recommendations to obtain high early bond strength, internal cohesive strength and surface durability. Do not cure in a manner which would significantly alter materials modulus of elasticity or other characteristics.
- B. Installer shall advise the General Contractor of procedures required for curing and protection of sealants and caulking compounds during construction period, so that they will be without deterioration or damage (other than normal wear and weathering) at time of Owner's acceptance.

END OF SECTION 07920

SECTION 08112 - HOLLOW METAL WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this Section.

1.02 DESCRIPTION OF WORK:

- A. The extent of hollow metal work is shown on the drawings and schedules.
- B. This section includes hollow metal doors and pressed steel frames for doors and related openings.
- C. Related Work Specified Elsewhere:
 - 1. Section 08214 - High Pressure Decorative Laminate Faced Doors

1.03 QUALITY ASSURANCE:

- A. Provide doors and frames complying with Steel Door Institute "Recommended Specifications: Standard Steel Doors and Frames" (SDI-100) and as herein specified.
- B. Fire-rated door assemblies shall be Underwriter Laboratory.: Where fire-rated door assemblies are indicated or required, provide fire-rated door and frame assemblies that comply with NFPA 80 "Standard for Fire Doors and Windows", and have been tested, listed, and labeled in accordance with ASTM E 152 "Standard Methods of Fire Tests for Door Assemblies". All metal labels to be riveted to door and frames mylar labels not acceptable.

1.04 SUBMITTALS:

- A. Product Data: Submit manufacturer's specifications for fabrication and installation, including data substantiating that products comply with requirements.
- B. Shop Drawings: Submit shop drawings for the fabrication and installation of hollow metal work. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of finish hardware and reinforcements, and details of joints and connections.

1. Provide a schedule of doors and frames using same reference numbers for details and openings as those on the contract drawings.

1.05 DELIVERY, STORAGE AND HANDLING:

- A. Deliver hollow metal work cartoned or crated to provide protection during transit and job storage.
- B. Inspect hollow metal work upon delivery for damage. Minor damages may be repaired provided the finish items are equal in all respects to new work and acceptable to the Architect; otherwise remove and replace damaged items as directed.
- C. Store doors and frames at the building site under cover. Place units on at least 4" high wood sills or on floors in a manner that will prevent rust and damage. Avoid the use of non-vented plastic or canvas shelters which could create a humidity chamber. If the cardboard wrappers on doors become wet, remove carton immediately. Provide 1/4" spaces between stacked doors to promote air circulation.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. ASTM A653/A653M - Standard specification for sheet steel, zinc coated (galvanized) or zinc-iron alloy-coated (galvannealed) by the hot dip process (A60).
- B. ASTM A924 - specification for general requirements for steel sheet metallic coated by the hot dip process (A60).
- C. ASTM A1009/A1008M - Standard specification for steel sheet, cold rolled, carbon, high strength low-alloy, high strength low alloy with improved formability, solution hardened, and bake hardenable.
- D. Supports and Anchors: Fabricate of not less than 16 gage sheet metal. Galvanize after fabrication units to be built into exterior walls, complying with ASTM A 153, Class B.
- E. Inserts, Bolts and Fasteners: Manufacturer's standard units, except hot-dip galvanize items to be built into exterior walls, complying with ASTM A 153, Class C or D as applicable.

- F. Shop-Applied Paint: Rust-inhibitive enamel or paint, either air-drying or baking, suitable as base for specified finish paints on steel surfaces.

2.02 FABRICATION, GENERAL:

- A. Fabricate hollow metal units to be rigid, neat in appearance, and free from defects, warp or buckle. Accurately form metal to required sizes and profiles. Wherever practicable, fit and assemble units in the manufacturer's plant. Clearly identify work that cannot be permanently factory-assembled before shipment to assure proper assembly at the project site. Weld exposed joints continuously; grind, dress, and make smooth, flush, and invisible. Metallic filler to conceal manufacturing defects is not acceptable.
- B. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat Phillips or Jackson heads for exposed screws and bolts.
- C. Finish Hardware Preparation:
 - 1. Prepare hollow metal units to receive mortised and concealed finish hardware, including cutouts, reinforcing, drilling, and tapping in accordance with final Finish Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A 115 series specifications for door and frame preparation for hardware.
 - 2. Reinforce hollow metal units to receive surface-applied hardware. Drilling and tapping for surface-applied finish hardware may be done at project site.
 - 3. Locate finish hardware as shown on final shop drawings, or if not shown, in accordance with "Recommended Locations for Builder's Hardware", published by Door and Hardware Institute.
- D. Shop Painting:
 - 1. Clean, treat and paint exposed surfaces of fabricated hollow metal units, including galvanized surfaces.
 - 2. Clean steel surfaces of mill scale, rust, oil, grease, dirt and other foreign materials before application of paint.

3. Apply pretreatment to cleaned metal surfaces, using cold phosphate solution (SSPC-PT-2), hot phosphate solution (SSPC-PT4) or basic zinc chromate-vinyl butyral solution (SSPC-PT3).
 4. Apply shop coat or prime paint within time limits recommended by pretreatment manufacturer. Apply a smooth coat of even consistency to provide a uniform dry film thickness of not less than 2.0 mils.
- E. Manufacturer: Provide hollow metal work by one of the following:
1. Ceco Door Products
 2. Curries
 3. Steelcraft/Div of Ingersol Rand

2.03 FRAMES:

- A. Provide hollow metal frames for doors, side-lights, borrowed lights, and other openings of sizes and profiles as indicated.
- B. Fabricate frames of full-welded unit construction with corners mitered, reinforced, continuously welded full depth and width of frame, unless otherwise indicated.
 1. Knock-down type frames are not acceptable.
- C. Form interior frames of either cold or hot-rolled sheet steel.
 1. Gage: Not less than 14, for interior openings up to and including 4'-0" wide.
 2. For openings over 4'-0" wide, increase thickness by at least two standard gages.
- D. Finish Hardware Reinforcement: Reinforce frames for required finish hardware as follows:
 1. Hinges and Pivots: Steel plate 3/16" thick x 1-1/2" wide x 6" longer than hinge, secured by not less than six spot-welds.
 2. Strike Plate Clips: Steel plate 3/16" thick x 1-1/2" wide x 3" long.
 3. Surface-Applied Closers: 12 gage steel sheet, secured with not less than six spot-welds.

4. Concealed Closers: Removable steel access plate, 12 gage internal reinforcement of size and shape required, and enclosing housing to keep closer pocket free of mortar or other materials.
- E. Head Reinforcing: Where installed in masonry, leave vertical mullions in frames open at top for grouting.
- F. Jamb Anchors: Furnish jamb anchors as required to secure frames to adjacent construction, formed of not less than 18 gage galvanized steel.
 1. Masonry Construction: Adjustable, flat, corrugated or perforated T-shaped to suit frame size, with leg not less than 2" wide by 10" long. Furnish at least three anchors per jamb up to 7'-6" height; four anchors up to 8'-0" jamb height; one additional anchor for each 24" or fraction thereof over 8'-0" height.
 2. In-Place Concrete or Masonry: Anchor frame jambs with minimum 3/8" concealed bolts into expansion shields or inserts at 6" from top and bottom and 26" o.c., unless otherwise shown. Reinforce frames at anchor locations. Apply removable stop to cover anchor bolts unless otherwise indicated.
- G. Floor Anchors: Provide floor anchors for each jamb and mullion which extends to floor, formed of not less than 14 gage galvanized steel sheet as follows:
 1. Monolithic Concrete Slabs: Clip type anchors with two holes to receive fasteners, welded to bottom of jambs and mullions.
- H. Head Anchors: Provide two anchors at head of frames exceeding 42" wide for frames mounted in steel stud walls.
- I. Head Strut Supports: Provide 3/8" x 2" vertical steel struts extending from top of frame at each jamb to supporting construction above, unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction above. Provide adjustable bolted anchorage to frame jamb members.
- J. Structural Reinforcing Members: Provide as part of frame assembly, where indicated at mullions, transoms, or other locations which are to be built into frame.

- K. Head Reinforcing: For frames over 4'-0" wide in masonry wall openings, provide continuous steel channel or angle stiffener not less than 12 gage for full width of opening welded to back of frame at head.
- L. Spreader Bars: Provide removable spreader bar across bottom of frames, tack welded to jambs and mullions.
- M. Rubber Door Silencers: Except on weatherstripped doors, drill stops to receive three silencers on single-door frames and four silencers on double door frames. Install plastic plugs to keep holes clear during construction.
- N. Plaster Guards: Provide 26 gage steel plaster guards or dust cover boxes, welded to frame at back of finish hardware cutouts where mortar or other materials might obstruct hardware installation.

2.04 STOPS AND MOLDINGS:

- A. Form fixed stops integral with frame, unless otherwise indicated.

PART 3 - EXECUTION

3.01 INSPECTION:

- A. Installer must examine substrate and conditions under which hollow metal work is to be installed and must notify the General Contractor, in writing, of any conditions detrimental to proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.02 INSTALLATION:

- A. Install hollow metal units and accessories in accordance with final shop drawings, manufacturer's data, and as herein specified.
- B. Setting Masonry Anchorage Devices:
 - 1. Provide masonry anchorage devices where required for securing hollow metal frames to in-place concrete or masonry construction.

2. Set anchorage devices opposite each anchor location, in accordance with details on final shop drawings and anchorage device manufacturer's instructions. Leave drilled holes rough, not reamed, and free from dust and debris.
3. Floor anchors may be set with powder-actuated fasteners instead of masonry anchorage devices and machine screws, if so indicated on final shop drawings.

C. Placing Frames:

1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After all construction is complete, remove temporary braces and spreaders leaving surfaces smooth and undamaged.
2. Protective Coating: In masonry walls, protect inside (concealed) faces of door frames using fibered asphalt emulsion coating. Apply approximately 1/8" thick over shop primer and allow to dry before handling.
3. In masonry construction, building-in of anchors and grouting of frames is included in Section 04300 "Unit Masonry Work" of these specifications.
4. At in-place concrete or masonry construction, set frames and secure in place with machine screws and masonry anchorage devices.
5. Place frames at fire-rated openings in accordance with NFPA Standard No. 80.
6. Make field splices in frames as detailed on final shop drawings, welded and finished to match factory work.
7. Remove spreader bars only after frames or bucks have been properly set and secured.

D. Door Installation (Refer to Section 08214 - High Pressure Decorative Laminate Faced Doors):

1. Fit plastic laminate doors accurately in their respective frames with the following clearances:
 - a. Jambs and Head: 3/32".
 - b. Meeting Edges, Pairs of Doors: 1/8".
 - c. Bottom: 1/4" at threshold or carpet.

- d. Bottom: 1/4" to threshold or tile.
 - e. Head: 1/8" to bottom of head or transom panel.
2. Place fire-rated doors with clearances as specified in NFPA Standard No. 80.
 3. Finish Hardware installation is specified in Section 08710.

3.03 ADJUST AND CLEAN:

- A. Final Adjustments: Check and re-adjust operating finish hardware items in hollow metal work just prior to final inspection. Leave work in complete and proper operating conditions. Remove and replace defective work, including doors or frames which are warped, bowed or otherwise unacceptable.
- B. Prime Coat Touch-Up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

END OF SECTION 08112

SECTION 08214 - HIGH-PRESSURE DECORATIVE LAMINATE FACED DOORS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Interior High-Pressure Decorative Laminate Faced Doors:
 - 1. Flush solid-core high-pressure decorative laminate doors.

1.2 RELATED SECTIONS

- A. Section 08112 - Hollow Metal Work
- B. Section 08710 - Finish Hardware

1.3 REFERENCES

- A. ANSI A208.1 - Particleboard.
- B. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- C. ASTM E 413 - Classification for Rating Sound Insulation.
- D. AWI Section 1300 - Architectural Flush Doors.
- E. NEMA LD3 - High Pressure Decorative Laminates.
- F. WDMA I.S.1-A - Architectural Wood Flush Doors.

1.4 SUBMITTALS

- A. Comply with Section 01340 - "Shop Drawings, Product Data and Samples" for Submittal Procedures.
- B. Product Data: Submit manufacturer's product data, including door construction description and WDMA I.S.1-A and AWI classifications.
- C. Schedules: Submit manufacturer's schedules, including door dimensions, cutouts, high-pressure decorative laminate selection, and hardware. Reference individual door numbers as indicated on the Drawings.

- D. Samples:
 - 1. Submit manufacturer's door construction samples for door model specified.
 - 2. Submit manufacturer's sample chip with color and finish number.
- E. Manufacturer's Certification: Submit manufacturer's certification that doors comply with specified requirements and are suitable for intended application.
- F. Cleaning Instructions: Submit manufacturer's cleaning instructions for doors.
- G. Warranty: Submit manufacturer's standard warranty.

1.5 QUALITY ASSURANCE

- A. Tolerances for Warp, Telegraphing, Squareness, and Prefitting Dimensions: WDMA I.S.1-A and AWS.
- B. Identifying Label: Each door shall bear identifying label indicating:
 - 1. Door manufacturer.
 - 2. Order number.
 - 3. Door number.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Delivery:
 - 1. Deliver doors to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
 - 2. Package doors individually in polybags.
- B. Storage:
 - 1. Store doors in accordance with manufacturer's instructions.
 - 2. Store doors in clean, dry area indoors, protected from damage and direct sunlight.
 - 3. Store doors flat on level surface.
 - 4. Do not store doors directly on concrete.
 - 5. Keep doors completely covered. Use covering which allows air circulation and does not permit light to penetrate.
 - 6. Store doors between 50 and 90 degrees F (10 and 32 degrees C) and 25 to 55 percent relative humidity.

- C. Handling:
1. Handle doors in accordance with manufacturer's instructions.
 2. Protect doors and finish during handling and installation to prevent damage.
 3. Handle doors with clean hands or clean gloves.
 4. Lift and carry doors. Do not drag doors across other doors or surfaces.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Do not subject doors to extreme conditions or changes in temperature or relative humidity in accordance with WDMA I.S.1-A.

1.8 WARRANTY

- A. Warrant solid core, interior doors for life of installation against warpage, delamination, and defects in materials and workmanship.
- B. Defects noted during warranty period shall be corrected at no cost to Owner. Corrective work shall include labor and material for repair, replacement, refinishing, and rehanging as required.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. VT Industries, Inc., 1000 Industrial Park, PO Box 490, Holstein, Iowa 51025. Toll Free (800) 827-1615. Phone (712) 368-4381. Fax (712) 368-4111. Website www.vtindustries.com. E-mail door_info@vtindustries.com.
- B. Equal by Marshfield or Eggers.

2.2 GENERAL

- A. High-Pressure Decorative Laminates: NEMA LD3.
1. Face laminate doors with high-pressure decorative laminates.
 2. Nominal Minimum Thickness for Faces and Vertical Edges: 0.048 inch.
 3. Laminate Selection: Standard products of Formica, Nevamar, Pionite, Wilsonart, or equal.
 4. Finish: Manufacturer's standard.
 5. Grade: General purpose, horizontal grade.

2.3 FLUSH SOLID-CORE HIGH-PRESSURE DECORATIVE LAMINATE DOORS

A. Flush Solid-Core High-Pressure Decorative Laminate Doors:

1. Model: 909H, agrifiber core, non-rated.
2. Compliance: WDMA I.S.1-A.
 - a. Quality Grade: Premium grade, extra heavy duty.
 - b. Type: PC-HPDL-5.
3. 7-Ply and Non-Bonded Core Construction: Not acceptable.
4. Door Thickness: 1-3/4 inches.
5. STC Rating
 - a. 909H: STC 30, non-rated.
6. Stiles:
 - a. 1-3/8 inches wide, before prefitting.
 - b. Structural composite lumber (SCL).
 - c. Edged with high-pressure decorative laminate before face laminates.
 - d. Stain stile edges.
7. Rails:
 - a. Structural composite lumber (SCL).
 - b. Minimum Width Before Prefitting: 1-3/8 inches.
8. Core:
 - a. Material: Agrifiber
 - b. Agrifiber Compliance: ANSI A208.1, Grade 1-LD-2.
9. Door Assembly:
 - a. Glue stiles and rails to core.
 - b. Sand entire assembly flat as a unit to ensure minimal telegraphing of core composite crossbands components through face laminates.
10. Laminates:
 - a. Apply to core in hot press using Type I, exterior, water-resistant adhesive.
 - b. 5-ply construction.

2.4 FABRICATION

- A. Stile Edges: Apply laminate edges before application of face laminates.
- B. Prefit Doors:
 1. Prefit and bevel doors at factory to fit openings.
 2. Prefit Tolerances: WDMA I.S.1-A.
- C. Factory-machine doors for mortised hardware, including pilot holes for hinge screws and lock fronts.
- D. Top and Bottom Rails: Factory sealed.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine locations to receive doors. Notify General Contractor in writing of conditions that would adversely affect installation or subsequent use. Do not begin installation until unacceptable conditions are corrected.
- B. Ensure frames are solidly anchored, allowing no deflection when doors are installed.
- C. Ensure frames are plumb, level, square, and within tolerance.

3.2 PREPARATION

- A. Allow doors to become acclimated to building temperature and relative humidity for a minimum of 24 hours before installation.

3.3 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions.
- B. Install doors plumb, level, square, true to line, without warp or rack.
- C. Seal exposed surfaces with a minimum of 2 coats of polyurethane within 4 days of fitting each door.
- D. Install door hardware as specified in Section 08710.

3.4 ADJUSTING

- A. Adjust doors to swing freely, without binding in frame.
- B. Adjust hardware to operate properly.
- C. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.
- D. Remove and replace damaged doors that cannot be successfully repaired, as determined by Architect.

3.5 CLEANING

- A. Clean doors promptly after installation in accordance with manufacturer's instructions.
- B. Do not use harsh cleaning materials or methods that could damage finish.

3.6 PROTECTION

- A. Protect installed doors from damage during construction.
- B. Place polybags over doors after adjusting and cleaning.

END OF SECTION 08214

SECTION 08305 - ACCESS DOORS & PANELS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this Section.

1.02 DESCRIPTION OF WORK:

- A. The extent, location and size of each type of access door required are shown on the drawings.
- B. Related work specified elsewhere:
 - 1. Masonry Section 04300
 - 2. Gypsum Drywall Section 09250
 - 2. Division 15 Mechanical
 - 3. Division 16 Electrical

1.03 QUALITY ASSURANCE:

- A. Fire-Resistance Ratings: Wherever a fire-resistance classification is indicated, provide access door assembly with panel door, frame, hinge, and latch from manufacturer listed in Underwriters' Laboratories, Inc. "Classified Building Materials Index" for the rating shown.
 - 1. Provide UL label on each fire-rated access door.
- B. Size Variations: Obtain Architects' acceptance of manufacturer's standard size units which may vary slightly from sizes indicated.
- C. Manufacturer: Provide access doors as manufactured by one of the following:
 - 1. Larsens
 - 2. Karp Associates Inc.
 - 3. Milcor
 - 4. Babcock-Davis

D. Inserts and Anchorages:

1. Furnish inserts and anchoring devices which must be built into other work for the installation of access doors. Coordinate delivery with other work to avoid delay.

1.04 SUBMITTALS:

A. Manufacturer's Data:

1. For information only, submit 2 copies of manufacturer's technical data and installation instructions for each type of access door assembly. Transmit copy of each instruction to the Installer.
 - a. Provide setting drawings, templates, instructions and directions for installation of anchorage devices.

PART 2 - PRODUCTS

2.01 MATERIALS & FABRICATION:

- A. General: Furnish access door assemblies manufactured as an integral unit, complete with all parts and ready for installation.
- B. Steel Access Doors and Frames: Fabricate units of continuous welded steel construction, unless otherwise indicated. Grind welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of the type required to secure access panels to the types of support shown.
- C. Frames:
 1. Fabricate from min. 12 gauge stainless steel with a #4 satin finish.
 2. Fabricate frame with exposed flange approximately 1" wide around perimeter of frame for units installed in the following construction.
 - a. Exposed masonry.
 - b. Drywall finish.

3. For installation in masonry construction, furnish frames with adjustable metal masonry anchors.

D. Flush Panel Doors:

1. Fabricate from not less than 12 gage stainless steel with a #4 satin finish with concealed spring hinges set to open to 175 degrees.
2. Provide flush panel doors, unless otherwise indicated.
3. For fire-rated units, provide manufacturer's standard insulated flush panel doors.

E. Locking Devices:

1. Interior: Furnish flush, spanner head cam locks of the number required to hold door in flush, smooth plane when closed.

F. Schedule: Provide the following types of access panels (basis of design is Larsens):

1. Wall Applications: Model L-DPM minimum size 24" x 24" with masonry anchors where required and prep for spanner head cam lock provided by Larsens. Provide where indicated on mechanical/electrical/architectural drawings or required by code to access existing/new valves, junction boxes, etc.
 - a. At fire rated locations provide Model L-DPFB (with masonry anchors for wall applications where required) and prep for spanner head cam lock provided by Larsens. 24" x 24" minimum for wall applications. Rating shall be same as wall fire rating on drawings.
2. Ceiling Application: Model L-DPM minimum size 18" x 18" with prep for spanner head cam lock provided by Larsens. Provide where indicated on mechanical/electrical drawings or required by code to access existing/new valves, junction boxes, etc.

PART 3 - EXECUTION

3.01 INSPECTION:

- A. Installer must examine the conditions under which access doors are to be installed and notify the General Contractor, in writing, of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.02 INSTALLATION:

- A. Comply with manufacturer's instructions for installation of access doors.
- B. Coordinate installation with work of other trades.
- C. Set frames accurately in position and securely attach to supports with face panels plumb or level in relation to adjacent finish surfaces.
- D. Adjust hardware and panels after installation for proper operation.
- E. Remove and replace panels or frames which are warped, bowed or otherwise damaged.

END OF SECTION 08305

SECTION 08710 - FINISH HARDWARE

PART 1 - GENERAL

1.1 Refer to "General and Special Conditions", and "Instructions to Bidders", Division 1 of Specifications. Requirements of these Sections and the project drawings shall govern work in this section.

1.2 Work Included:

A. Furnish all items of Finish Hardware specified, scheduled, shown or required herein except those items specifically excluded from this section of the specification.

B. Related work:

1. Division 1 - General Requirements
2. Section 06100 - Carpentry
3. Section 08112 - Hollow Metal Work
4. Section 08214 - High Pressure Decorative Laminate Faced Doors

C. Specific Omissions: Hardware for the following is specified or indicated elsewhere, unless specifically listed in the hardware sets:

1. Cabinet Hardware.
2. Access doors and panels

1.3 Quality Assurance

A. Requirements of Regulatory Agencies:

1. Furnish finish hardware to comply with the requirements of laws, codes, ordinances, and regulations of the governmental authorities having jurisdiction where such requirements exceed the requirements of the Specifications.

2. Furnish finish hardware to comply with the requirements of the regulations for public building accommodations for physically handicapped persons of the governmental authority having jurisdiction and to comply with Americans with Disabilities Act.
3. Provide hardware for fire-rated openings in compliance with NFPA 80 and state and local building code requirements. Provide only hardware that has been tested and listed by UL for types and sizes of doors required and complies with requirements of door and door frame labels.

B. Hardware Supplier:

1. Shall be an established firm dealing in contract builders' hardware. He must have adequate inventory, qualified personnel on staff and be located within 100 miles of the project. The distributor must be a factory-authorized dealer for all materials required. The supplier shall be or have in employment an Architectural Hardware Consultant (AHC).

C. Pre-installation Meeting:

1. Before hardware installation, General Contractor will request a hardware installation meeting be conducted on the installation of hardware; specifically that of locksets, closers, exit devices, overhead stops and coordinators. Manufacturer's representatives of the above products, in conjunction with the hardware supplier for the project, shall conduct the meeting. Meeting to be held at job site and attended by installers of hardware for aluminum, hollow metal and wood doors. Meeting to address proper coordination and installation of hardware, per finish hardware schedule for this specific project, by using installation manuals, hardware schedule, templates, physical product samples and installation videos.
2. Convene one week or more prior to commencing work of this Section.
3. The Hardware Supplier shall include the cost of this meeting in his proposal.

D. Manufacturer:

1. Obtain each type of hardware (latch and locksets, hinges, closers, etc.) from a single manufacturer, although several may be indicated as offering products complying with requirements.

1.4 Submittals:

A. Hardware Schedule

1. Submit number of Hardware Schedules as directed in Division 1.
2. Follow guidelines established in Door & Hardware Institute Handbook (DHI) Sequence and Format for the Hardware Schedule unless noted otherwise.
3. Schedule will include the following:
 - a. Door Index including opening numbers and the assigned Finish Hardware set.
 - b. Preface sheet listing category only and manufacturer's names of items being furnished as follows:

CATEGORY	SPECIFIED	SCHEDULED
Hinges	Manufacturer A	Manufacturer B
Lock sets	Manufacturer X	Manufacturer X
Kick Plates	Open	Manufacturer Z

- c. Hardware Locations: Refer to Article 3.1 B.2 Locations.
- d. Opening Description: Single or pair, number, room locations, hand, active leaf, degree of swing, size, door material, frame material, and UL listing.
- e. Hardware Description: Quantity, category, product number, fasteners, and finish.
- f. Headings that refer to the specified Hardware Set Numbers.
- g. Scheduling Sequence shown in Hardware Sets.

- h. Product data of each hardware item, and shop drawings where required, for special conditions and specialty hardware.
- i. Electrified Hardware system operation description.
- j. "Vertical" scheduling format only. "Horizontal" schedules will be returned "Not Approved."**
- k. Typed Copy.
- l. Double-Spacing.
- m. 8-1/2 x 11 inch sheets
- n. U.S. Standard Finish symbols or BHMA Finish symbols.

B. Product Data:

- 1. Submit, in booklet form Manufacturers Catalog cut sheets of scheduled hardware.
- 2. Submit product data with hardware schedule.

C. Samples:

- 1. Prior to submittal of the final hardware schedule and prior to final ordering of finish hardware, submit one sample, if required, of each type of exposed hardware unit, finished as required and tagged with full description for coordination with schedule.
- 2. Samples will be returned to the supplier. Units, which are acceptable and remain undamaged through submittal, review and field comparison procedures may, after final check of operation, be used in the work, within limitations of keying coordination requirements.

D. Key Schedule:

- 1. Submit detailed schedule indicating clearly how the Owner's final keying instructions have been followed.
- 2. Submit as a separate schedule.

E. Submit to General Contractor, the factory order acknowledgement numbers for the various hardware items to be used on the project. The factory order acknowledgement numbers shall help to facilitate and expedite any service that may be required on a particular hardware item. General Contractor/Construction Manager shall keep these

order acknowledgement numbers on file in the construction trailer.

1.5 Product Delivery, Storage, and Handling:

- A. Label each item of hardware with the appropriate door number and Hardware Schedule heading number, and deliver to the installer so designated by the contractor.

1.6 Warranties:

- A. Refer to Division 1 for warranty requirements.
- B. During the warranty period, replace defective work, including labor, materials and other costs incidental to the work. Replace work found to be defective as defined in the General Conditions.

PART 2 - PRODUCT

2.1 Furnish each category with the products of only one manufacturer unless specified otherwise; this requirement is mandatory whether various manufacturers are listed or not.

2.2 Provide the products of manufacturer designated or if more than one manufacturer is listed, the comparable product of one of the other manufacturers listed. Where only one manufacturer or product is listed, it is understood that this is the owner's Building Standard and "no substitution" is allowed.

A. Hinges:

- 1. Furnish hinges of class and size as listed in sets.
- 2. Numbers used are IR-Ives (IVE).
- 3. Products of a BHMA member are acceptable.

B. Continuous Gear Hinge:

1. 6063-T6 aluminum alloy, anodized finish (cap on entire hinge painted if specified). Manufacture to template, uncut hinges non-handed, pinless assembly, three interlocking extrusions, full height of door and frame, lubricated polyacetal thrust bearing, fasteners 410 stainless steel plated and hardened. All hinge profiles to be manufactured to template bearing locations, with standard duty bearing configurations at 5-1/8" spacing with a minimum of 16 bearings: and heavy duty at 2-9/16" spacing with a minimum of 32 bearings. Anodizing of material shall be done after fabrication of components so that all bearing slots are anodized.
2. Length: 1" less than door opening height. Fastener 12-24 x 1/2" #3 Phillips keen form stainless steel self-tapping at aluminum and hollow metal doors, 12-1/2" #3 Philips, flathead full thread at wood doors.
3. Furnish fire rated hinges "FR" at labeled openings.
4. Numbers used are IR-Ives.
 - a. For Hollow Metal frames;
 - 1) IR-Ives 224HD
 - 2) Equal products by Hager and Select will also be accepted.
 - b. For Aluminum frames;
 - 1) IR-Ives 112HD
 - 2) Equal products by Hager and Select will also be accepted.

C. Locksets and Latchsets - Mortise Type:

1. Locksets shall be manufactured from heavy gauge steel, minimum lockcase thickness 1/8", containing components of steel with a zinc dichromate plating for corrosion resistance.
2. Locks are to have a standard 2 3/4" backset with a full 3/4" throw two-piece stainless steel mechanical anti-friction latchbolt. Deadbolt shall be a full 1" throw, constructed of stainless steel.
3. Lockcase shall be easily handed without chassis disassembly by removing handing screw on lockcase and installing in opposite location on reverse side. Changing of door hand bevel from standard to reverse

hand shall be done by removing the lockcase scalp plate, and pulling and rotating the latchbolt 180 degrees.

4. Lock trim shall be through-bolted to the door to assure correct alignment and proper operation. Lever trim shall have external spring cage mechanism to assist in support of the lever weight. Thumb turns shall have "EZ" thumbturn equal to IR-Schlage L583-363.
5. Function numbers are IR-Schlage.
 - a. IR-Schlage L9000
6. Lockset Trim:
 - a. IR-Schlage 17N
7. Provide strikes with extended lips where required to protect trim from being marred by latch bolt. Provide strike lips that do not project more than 1/8" beyond door frame trim at single doors and have 7/8" lip to center at pairs of 1-3/4" doors.

D. Push and Pull Hardware:

1. Push Plates: Ives 8200 Series 6 x 16 x .050 inches. If stile widths will not accept 6 inches, provide stile width less two inches.
2. Push Bars: IR-Von Duprin 330/350
3. Pull, Offset: One inch round rod, 90 degree offset, 12 inch centers.
4. Pull Plates: IR-Ives 8303-8 4 x 16 x .050 inches. 8" center.
5. Manufacturer: Provide push and pull hardware from any member of B.H.M.A.

E. Closers:

1. Door closers shall have fully hydraulic, full rack and pinion action with a high strength cast iron cylinder. Cylinder body shall be 1 1/2" in diameter, and double heat treated pinion shall be 11/16" in diameter with double D slab drive arm connection.
2. Hydraulic fluid shall be of a type requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
3. Spring power shall be continuously adjustable over the full range of closer sizes, and allow for reduced

opening force for the physically handicapped. Hydraulic regulation shall be by tamper-proof, non-critical valves. Closers shall have separate adjustment for latch speed, general speed, and backcheck.

4. All closers shall have solid forged steel main arms (and forged forearms for parallel arm closers).
5. All surface mounted mechanical closers shall be certified to exceed ten million (10,000,000) full load cycles by a recognized independent testing laboratory.
6. Closers will have Powder coating finish certified to exceed 100 hours salt spray testing by ETL, an independent testing laboratory used by BHMA for ANSI certification.
7. Refer to door and frame details and furnish accessories such as drop plates, panel adapters, spacers and supports as required to correctly install door closers. State degree of door swing in the hardware schedule.
8. IR-LCN Series as listed in sets.

F. Overhead Holders and Stops:

1. Type, function and fasteners must be same as Glynn-Johnson specified. Size per manufacturer's selector chart. Plastic end caps, hold open mechanisms and shock blocks are not allowed. End caps must be finished same as balance of unit.
2. Manufacture products using base material of Brass/Bronze for US3, US4, & US10B finished products and 300 Stainless Steel for US32 & US32D finished products.
3. Type, function, and fasteners must be the same as Glynn-Johnson specified. Size per manufacturer's selector chart.
 - a. IR-Glynn-Johnson

G. Kick Plates:

1. Furnish .050 inches thick 10" high x door width less 1.5" at single doors and less 1" at pairs. Where glass or louvers prevent this height, supply with height equal to height of bottom rail less 2".

2. Any BHMA manufacturing product meeting above is acceptable.

H. Wall Stops:

1. Length to exceed projection of all other hardware. Provide with threaded studs and expansion shields for masonry wall construction. Install with slope at top.
 - a. IR-Ives WS33(X)
 - b. BHMA L12011 or L12021

I. Miscellaneous:

1. Furnish items not categorized in the above descriptions but specified by manufacturer's names in Hardware Sets.

J. Fasteners:

1. Furnish fasteners of the proper type, size, quantity and finish. Use machine screws and expansion shields for attaching hardware to concrete or masonry, and wall grip inserts at hollow wall construction. Furnish machine screws for attachment to reinforced hollow metal doors and frames and reinforced aluminum doors and frames. Furnish full thread wood screws for attachment to solid wood doors and frames. "TEK" type screws are not acceptable.
2. **Sex bolts will not be permitted on reinforced metal doors or wood doors where blocking is specified.**

2.3 Finishes:

- A. Generally, Dull Chrome, US26D / BHMA 626. Provide finish for each item as indicated in sets.
- B. Generally, Dark Bronze, US10B / BHMA 613. Provide finish at Aluminum & FRP openings. Provide finish for each item as indicated in sets.
- C. Coordinate with the existing conditions at each school, the architect and all related trades.

2.4 Templates and Hardware Location:

- A. Furnish hardware made to template. Supply required templates and hardware locations to the door and frame manufacturers.
- B. Furnish metal template to frame/door supplier for continuous hinge.
- C. Refer to Article 3.1 B.2, Locations, and coordinate with templates.

2.1 Cylinders and Keying:

- A. All cylinders for this project will be supplied by one supplier regardless of door type and location.
- B. Provide a cylinder for all hardware components capable of being locked.
- C. Provide all cylinders with Schlage "FG" keyway.
- D. Provide cylinders keyed alike.
- E. Provide 10 keys for use by the contractor(s) during the construction period.
- F. Final keying will be done by Great Lakes Locksmiths.
- G. The finish Hardware supplier will include the cost of Great Lakes Locksmiths work in their bid proposal.

PART 3 - EXECUTION

3.1 Installation

A. General:

- 1. Install hardware according to manufacturers installations and template dimensions. Attach all items of finish hardware to doors, frames, walls, etc. with fasteners furnished and required by the manufacture of the item.

2. Provide blocking/reinforcement for all wall mounted Hardware.
3. Reinforced hollow frames.
4. High Pressure Decorative Laminate Faced Doors: full thread wood screws. Drill pilot holes before inserting screws.
5. Continuous gear hinges attached to hollow metal doors and frames: 12-24 x 1/2" #3 Phillips Keenform self-tapping. Use #13 or 3/16 drill for pilot.
6. Continuous Gear Hinges require continuous mortar guards of foam or cardboard 1/2" thick x frame height, applied with construction adhesive.

B. Locations:

1. Dimensions are from finish floor to center line of items.
2. Include this list in Hardware Schedule.

<u>CATEGORY</u>	<u>DIMENSION</u>
Hinges	Door Manufacturer's Standard
Flush Bolt Levers	72" and 12"
Levers	Door Manufacturer's Standard
Exit Device Touchbar	Per Template
Offset Pulls	Suitable for Exit Devices
Push Plates	52"
Pull Plates	42"
Wall Stops/holders	At Head

C. Final Adjustment:

1. Provide the services of a representative to inspect material furnished and its installation and adjustment, to make final hardware adjustment, and to instruct the Owner's personnel in adjustment, care and maintenance of hardware.
2. Locksets, closers and exit devices shall be inspected by the factory representative and adjusted after installation and after the HVAC system is in operation, to insure correct installation and proper adjustment in operation. The manufacturer's representative shall prepare a written report stating compliance, and also recording locations and kinds of

noncompliance. The original report shall be forwarded to the Architect with copies to the Contractor, hardware distributor, hardware installer and building owner.

D. Technical and Warranty Information:

1. At the completion of the project, the technical and warranty information coalesced and kept on file by the General Contractor shall be given to the Owner or Owner's Agent. In addition to both the technical and warranty information, all factory order acknowledgement numbers supplied to the General Contractor during the construction period shall be given to the Owner or Owner's Agent. The warranty information and factory order acknowledgement numbers shall serve to both expedite and properly execute any warranty work that may be required on the various hardware items supplied on the project.
2. Submit to General Contractor, two copies each of parts and service manuals and two each of any special installation or adjustment tools. Include for locksets, exit devices, door closers and any electrical products.

3.2 Hardware Sets:

HW SET: 01 (DOORS 106 & 107)

3	EA	HINGE	5BB1HW 5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 4 X 16	630	IVE
1	EA	PULL PLATE	8302-8 4 X 16	630	IVE
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 34.5"	630	IVE
1	EA	WALL STOP/HOLDER	WS40	626	IVE

WARREN WOODS PUBLIC SCHOOLS
POHI TOILET ROOM RENOVATIONS
TOWER HIGH SCHOOL

131480

MAY 17, 2013

HW SET: 02 (DOOR 108)

1	EA	HINGE	5BB1HW 5 X 4.5	652	IVE
1	EA	PRIVACY LOCK	L9496BDC 03N L583-363	626	SCH
1	EA	CORE		626	BES
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 34.5"	630	IVE
1	EA	WALL STOP	WS33	626	IVE

END OF SECTION

SECTION 09300 - TILE WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this Section.

1.02 DESCRIPTION OF WORK:

- A. The extent of tile work is shown on drawings and in schedules.
- B. Finishing and edge-protection profiles for walls, corners and steps.

1.03 QUALITY ASSURANCE:

- A. Qualifications of Installers:
 - 1. For installation of porcelain ceramic tile and quarry tile, use only thoroughly trained and experienced personnel completely familiar with specified products, manufacturer's recommended methods of installation and requirements established for this work.
- B. Codes and Standards:
 - 1. Comply with recommendations of "Handbook for Ceramic Tile Installation" published by Tile Council of America.
 - 2. Comply with ANSI and ASTM Standards listed within this Section.
- C. Proprietary Materials: Handle, store, mix and apply proprietary setting and grouting materials in compliance with manufacturer's instructions.

1.04 SUBMITTALS:

- A. Product Data:
 - 1. For information only, submit two (2) copies of manufacturer's technical information and install instructions for all materials required, except bulk materials. Include certifications and other data as may be required to show compliance with these specifications. Transmit a copy of each instruction to the Installer.

2. Accompany materials list with two (2) copies of manufacturer's current recommended method of installation for each item. These recommendations, after review by Contractor and Architect/Engineer, shall form basis for acceptance or rejection of installed work.

B. Samples:

1. Submit three (3) samples of each type and color of tile required, not less than 12" square on plywood or hardboard backing and grouted. Submit samples of trim and 6" long sample of the marble threshold(s). Review will be for color, pattern and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor.

1.05 DELIVERY AND STORAGE:

- A. Deliver packaged materials and store in original containers with seals unbroken and labels in tact until time of use, in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Porcelain Ceramic Tile Mosaics - Floors (PCT:1)

1. Shall meet requirements of TCA 137.1 and the requirements of this section.
2. Porcelain ceramic tile mosaics for floor shall be:
 - a. Veranda Tones Line by Daltile 3" x 3" mesh mounted on a 13" x 13" sheet (sheet 12 7/8" x 12 7/8")
 1. Unpolished finish
 - a. Color: Redland Hills P531
 2. Provide 3" wide x cut tile in an integral slant base as mfr'd by Innovative Tile Systems, Burnsville, MN, 952-224-9141, FAX 952-224-1918"
 - a. Color: Redland Hills P531
 - b. Provide with all required trim pieces.
 - c. Provide ISB 1.5 (1-1/2" Profile).
3. Tile and integral slant base system available by contacting Jennifer McCormick, 1-616-862-4748

B. Porcelain Pavers Walls (PCT: 2)

1. Shall meet requirements of TCA 137.1 and requirements of this Section.
2. Porcelain pavers for walls shall be as follows:
 - a. Veranda Tones Line by Daltile
 1. Unpolished finish 13" x 20"
 - a. Color: Zen Garden PS30
 2. Provide with all required trim pieces.
 3. Available by contacting Jennifer McCormick
1-616-862-4748

C. Finishing/Edge Protection Profiles

1. Provide profiles as indicated below and on drawings as manufactured by Schluter Systems L.P., 194 Pleasant Ridge Road, Plattsburgh, NY 12901-5841, 1-800-472-4588, fax 1-800-477-9783 www.schluter.com
 - a. Corner Guard
 1. Schluter ECK-E: Roll formed type 304 (V2A) steel V-shaped profile with 1-15/32 inch (37mm) wide exposed surfaces joined by a symmetrically rounded corner with integrated trapezoid-perforated anchoring legs.
 2. Provide full height of wall or column as indicated on drawings.
 - b. Ramp Profile
 1. Schluter Reno-ramp: Anodized aluminum profile with textured, sloped exposed trapezoid perforated surface, tapered leading edge, integrated anchoring leg, and integrated grout joint spacer.
 2. Finish: satin anodized aluminum.
 3. Height: ½ inch (12.5mm) x 3½" (89mm) length (depth)

2.02 SETTING MATERIALS

A. MEDIUM SET MORTAR - for wall and floor tile installation unless noted otherwise.

1. Description: Factory prepared mortar and latex additive; complying with ANSI A118.4 and ISO standards C2TES1P1. Medium bed thickness; 3/8 to 3/4 inch thick floor installation.
 - a. Color: Gray
 - b. Acceptable Products:
 - i. MAPEI UltraFlex LFT, complies with ANSI A118.4
 - ii. Custom Building Products, MegaLite.
 - iii. Laticrete, 4XLT.
 - Iv TEC Ultimate Mortar

- B. Latex-Portland Cement Mortar: ANSI A118.4, composed as follows :
1. Mixture of Dry-Mortar Mix and Latex Additive: Mixture the prepackaged dry-mortar mix and liquid-latex additive complying with the following requirements:
 - a. Latex Additive: Acrylic resin.
 2. Provide one of the following products:
 - a. Mapei, Elk Grove Village, IL; Kerabond/Keralastic
 - b. Custom Building Products, Custom Blend/Custom Flex
 - c. Laticrete, Bethany, CT; Laticrete 272/333
 - d. TEC, Palatine, IL; Full set plus/Xtra Flex Additive
- C. Waterproofing and Crack Isolation Membrane: Provide materials complying with ANSI A118.10 and ANSI A118.12 and as specified below. Note: All tile (walls & floors) to be installed on crack isolation membrane.:
1. Mapelastc AquaDefense as manufactured by MAPEI Corp.
 2. Custom building products RedGard waterproofing and crack prevention membrane.
 3. Hydroment ultra-set advanced as manufactured by Bostik, Inc.
 4. Hydro-Ban waterproofing/anti-fracture membrane as manufactured by Laticrete International, Inc., Bethany, CT.
 5. Hydraflex as manufactured by TEC. Ready to use, flexible, mold and mildew resistant waterproofing and crack isolation membrane for interior and exterior applications.

2.03 GROUTING MATERIALS

- A. Epoxy-modified Grout Admixture: Complying with ANSI A118.8 and A118.3.
1. Provide one of the following manufacturers:
 - a. Mapei, Kerapoxy.
 - b. Custom Building Products, 100 Solids Epoxy Grout
 - c. TEC, EFX 100% Epoxy Grout
 - d. Laticrete, Bethany, CT, Spectralock Pro Grout.
- B. Color:
1. Floors and cove base: Based on Mapei 42 Mocha
 2. Walls: Base on Mapei 14 Biscuit

2.04 MISCELLANEOUS MATERIAL

- A. Latex Underlayment: Quick set type, as recommended by membrane manufacturer, as required to provide positive drainage to floor drains.
- B. Sealants for control joints in floors and walls, use one part fungicidal silicone rubber to match grout:
 - 1. Dow Corning 784
 - 2. Laticrete Latasil silicone sealant meeting Fed. Spec. TT-S-001543, Class A or B.
 - 3. TEC AccuColor 100, 100% silicone sealant low VOC ASTM C920.

PART 3 - EXECUTION

3.01 INSPECTION:

- A. Installer must examine the areas and conditions under which tile work is to be installed and notify the General Contractor, in writing, of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.02 PREPARATION:

- A. Prepare substrate to receive setting bed and tile recommended both by the manufacturer of the tile and of the setting bed materials.
 - 1. Fill cracks, holes and depressions with trowelable leveling and patching compound according to tile setting material manufacturer's written instructions.
 - 2. Remove protrusions, bumps and ridges by sanding or grinding.
 - 3. Provide concrete substrates for tile floors that comply with flatness tolerances specified in ANSI A108.
- B. Clean substrate as required and recommended to achieve bond using cleaners, detergents, etc.
- C. Neutralize and seal substrates as recommended.

3.03 INSTALLATION:

A. Tile Installation - General:

1. Provide installation of ceramic tile in accordance with the latest edition of the Tile Council of America's "Handbook for Ceramic Tile Installation."
2. Fit tile carefully against trim and around pipes, electrical boxes and other built-up fixtures so that escutcheons, plates and collars will completely overlap cut edges.
3. Smooth exposed edges and clean tile before installation.
4. Install porcelain ceramic tile with a 1/8" joint.
5. Joint designs shall be symmetrical within room or area; border tile be not less than 1/2 normal width. Floor tile shall be set in straight line design, with wall joints in alignment with floor tile where possible.
6. At junction of base tile and wall tile, at projections through tile and at junctions of tile to shower receptors, corner guards and similar equipment, leave joint ungrouted for sealing.
7. When using tile sheets, minimize tearing sheets apart.

3.04 SETTING METHODS

- A. Method and typical detailing for tile work shall be in accordance with the following TCA alphanumeric method, listing from the "Handbook for Ceramic Tile Installation", latest edition, by the Tile Council of America.
- B. Concrete Subfloors
 1. Slabs on grade (full set method): TCA setting method F114-12 (provide with waterproof and crack isolation membrane) full set Portland cement mortar; epoxy grout A118.3 complying with tile installation specification ANSI A118.4 and epoxy grout installation specification ANSI A108.6. Install crack isolation membrane per manufacturer's specs.

C. Walls

1. Masonry (Cement Mortar Bond Method): TCA Setting Method W211-12 with latex-portland cement mortar, ANSI A118.4 and epoxy grout ANSI A118.3, install per Tile Installation Specification: ANSI A108.6. Install crack isolation membrane per manufacturer's specs.

3.05 GROUTING

- A. Grouting shall be installed in accordance with ANSI A108.6 and the manufacturer's recommended procedures and precautions during application and cleaning.
- B. Rinse tilework thoroughly with clean water before and after using chemical cleaners.
- C. Base Installation:
 1. Over concrete and masonry, install base using dry-set portland cement mortar in accord with ANSI A108.5. Grout in accordance with ANSI A108.6 using epoxy grout specified for related tile floor.
- D. Jointing Pattern: Lay tile in pattern indicated. Layout tile work and enter tile fields both directions in such space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint width, unless otherwise shown.
- E. Expansion and Control Joints: Provide as indicated on drawings and as recommended by TCA and by tile and setting bed and grouting material manufacturer and as follows:
 1. Control Joints Locations: Comply with the Tile Council of America. (TCA) and where indicated.
 - a. Interior Locations (horizontal and vertical):
 1. Over any expansion joint, control joint, cold joint or seismic joint in the building structure.
 2. Expansion joints - 24 feet to 36 feet in each direction.
 3. Expansion joints - 8 feet to 12 feet where tile work located in direct sunlight or moisture locations.
 4. Where tile abuts restraining surfaces such as perimeter walls, dissimilar floors, curbs, columns, pipes, ceiling and where changes occur in backing materials.

5. Coordinate joint locations with the Architect and for other areas indicated or required.
 6. Joint width shall be 3/8 inch, unless otherwise indicated.
 7. Provide under-layment systems.
 8. Install compatible sealant and color approved by the Architect.
- F. Grout all tile using commercial epoxy grout as specified.
1. Temporarily protect tile as required to prevent staining.
- 3.06 ADJUST AND CLEAN:
- A. Cleaning:
1. Clean grout and setting materials from face of tile while materials are workable. Leave tile face clean and free of all foreign matter.
 2. Tile may be cleaned with acid solutions only when permitted by the tile and grout manufacturer's printed instructions, but not sooner than 14 days after installation. Protect metal surfaces, cast iron, and vitreous plumbing fixtures from effects of acid cleaning. Flush the surface with clean water before and after cleaning.
- B. Finished Tile Work:
1. Leave finished installation clean and free of cracked, chipped, broken, unbonded, or otherwise defective tile work.
- C. Protection:
1. Apply a protective coat of neutral protective cleaner to completed tile work.
 2. Protect installed tile work with Kraft paper or other heavy covering during the construction period to prevent damage and wear.
 3. Prohibit all foot and wheel traffic from using tiled floors for at least 3 days, preferably 7 days.
 4. Before final inspection, remove protective coverings and rinse neutral cleaner from all tile surfaces.

END OF SECTION 09300

SECTION 09510 - ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this Section.

1.02 DESCRIPTION OF WORK:

- A. The extent of acoustical panel ceiling is shown on the drawings and in schedules.

1.03 QUALITY ASSURANCE:

- A. Subcontract the installation of acoustical panel ceilings to an experienced installation firm which is acceptable to the manufacturer of the acoustical units, as shown by current written statement from the manufacturer.
- B. Standard for Terminology and Performance: Applicable publications by the Acoustical and Insulating Materials Association (AIMA), including "Performance Data, Architectural Acoustical Materials."
- C. Fire Hazard Classification: UL tested, listed and labeled as Class 0.25.

1.04 SUBMITTALS:

- A. Product Data:
 - 1. For information only, submit (2) copies of manufacturer's product specifications and installation instructions for each acoustical panel ceiling material required, and for suspension system, including certified laboratory test reports and other data as required to show compliance with these specifications. Distribute one additional copy of each installation instruction to the Installer.
 - a. Include manufacturer's recommendations for cleaning and refinishing acoustical panel, including precautions against materials and methods which may be detrimental to finishes and acoustical performance.

1.05 SAMPLES

1. Submit (3) sets of 12" square Samples for each acoustical panel required. In each set of samples show the full range of exposed color and texture to be expected in the completed work. Sample submittal and Architect's review will be for color and texture only. Compliance with other requirements is the exclusive responsibility of the Contractor.
2. Submit (3), 12" long samples of exposed runner and molding. Architect's review will be for color and texture only. Compliance with other requirements is the exclusive responsibility of the Contractor.

C. Maintenance Stock:

1. At the time of completing the installation, deliver stock of maintenance materials to the Owner. Furnish full size units matching the units installed, packaged with protective covering for storage and identified with appropriate labels. Furnish an amount equal to 5.0% of the amount installed.

1.06 JOB CONDITIONS:

- A. Space Enclosures: Do not install until interior acoustical panel ceilings unit space has been enclosed and is weather-tight, and until wet work in the space has been completed and is nominally dry and until work above ceilings has been completed, and until ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

PART 2 - PRODUCTS

2.01 CEILING UNITS:

- A. Acoustical Panels: (AT-1)
 1. Provide 24" x 24" vinyl face perforated fiberglass panel units not less than 5/8" thick, NRC 0.70 min, CAC n/a, light reflectance not less than 72%, square edge.

2. Acceptable Products:
 - a. Armstrong: Item No. 2908 "Random Fissured"
 - b. Certainteed: Item No. 1532-VINP-1 "Versatone (5/8") white vintage (perf.std).
 - c. USG: Item No. 7054G (perf.) "Premier Hi-Lite Clima-Plus Kapok Panels"
3. Install in 15/16" exposed tee grid.

2.02 CEILING SUSPENSION MATERIALS:

- A. General: Comply with ASTM C 635, as applicable to an intermediate duty suspension system. Coordinate with other work supported by or penetrating through the ceilings, including light fixtures and HVAC equipment.
- B. Attachment Devices: Size for (5) times the design load indicated in ASTM C 635, Table 1, Direct Hung.
 1. Hanger Wires: Galvanized carbon steel, ASTM A 641, soft temper, prestretched, yield-stress load of at least (3) times design load but not less than 12 USWG.
- C. Exposed Suspension System: Exposed systems compatible with tiles specified and as follows:
 1. Armstrong - 15/16" Prelude XL exposed tee grid.
 2. CertainTeed - 15/16" Classic Aluminum Capped Stab System.
 3. Donn - DX24 System; USG Interiors
 4. Chicago Metallic Corp: 1200 System.
- D. Edge Moldings: Manufacturer's standard channel molding for grid type used for edges and penetrations of ceiling, with a single flange of molding exposed, finish to match grid.

2.03 MISCELLANEOUS MATERIALS:

- A. Acoustical Sealant: A heavy-bodied, non-shrinking, non-drying, non-sag grade mastic compound intended for interior sealing of concealed construction joints.
- B. Tile Cement: As recommended by tile manufacturer.

PART 3 - EXECUTION

3.01 INSPECTION AND PREPARATION WORK:

- A. Installer must examine the conditions under which the acoustical ceiling work is to be performed and notify the General Contractor, in writing, of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.
- B. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid the use of less-than-half widths units at borders, and comply with reflected ceiling plans wherever possible.

3.02 INSTALLATION:

- A. General: Install material in accordance with manufacturer's printed instructions and comply with governing regulations as indicated, and industry standards applicable to the work.
- B. Install suspension systems to comply with ASTM C 636 with hangers supported only from building structural members as indicated. Locate hangers near each end and spaced 4' - 0' along direct-hung runners, unless otherwise indicated.
 - 1. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eye-screws, or other devices which are secure and appropriate for the substrate, and which will not deteriorate or fail with age or elevated temperatures.
- C. Install edge moldings at edges of each acoustical ceiling area and at locations where edge of units would otherwise be exposed after completion of the work, except where adhesively applied.
 - 1. Sealant Bed: Apply continuous ribbon of acoustical sealant, concealed pm back of vertical leg before fastening to vertical surface.
 - 2. Secure moldings to building construction by fastening with screw-anchors into the substrate through holes drilled in not more than 16" o.c. along each molding.

3. Level moldings with ceiling suspension system to level tolerance of 1/8" in 12' - 0".
 4. Miter corners of moldings accurately to provide hair- line joints, securely connected to prevent dislocation.
- D. Cope exposed flanges of intersection suspension system members so that flange faces will be flush (cope flange of member supported by other member) except as otherwise indicated.
- E. Install acoustical panels in coordination with suspension system, with edges concealed by support of suspension members. Scribe and cut panels to fit accurately at penetrations.
- F. Install edge trim moldings where indicated and elsewhere as needed to conceal edges of acoustical units which would otherwise be exposed to view after completion of the work. Anchor with fasteners, or if not possible, secure in place with permanent adhesive.

3.03 CLEANING AND PROTECTION:

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension members; comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work which cannot be successfully cleaned and required to permanently eliminate evidence of damage.
- B. The Installer shall advise the General Contractor of required protection for the acoustical panel ceilings, including temperature and humidity limitations and dust control, so that the work will be without damage and deterioration at the time of acceptance by the Owner.

END OF SECTION 09510

SECTION 09900 - PAINTING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this Section.

1.02 DESCRIPTION OF WORK:

- A. The extent of painting work is shown on the drawings and schedules, and as herein specified.
- B. The work includes painting and finishing of interior exposed items and surfaces throughout the project, except as otherwise indicated.
- C. The work includes field painting of exposed bare and covered pipe and ducts (excluding color coding), and of hangers, exposed steel and iron work, and primed metal surfaces of equipment installed under the mechanical and electrical work, except as otherwise indicated.
- D. Surface preparation, priming and coats of paint specified are in addition to shop-priming and surface treatment specified under other sections of work.
- E. "Paint" as used herein means all coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers and other applied materials, whether used as prime, intermediate or finish coats.
- F. Paint all exposed surfaces in areas designated "paint" in "schedules," except where the natural finish of the material is specifically noted as a surface not to be painted. Where items or surfaces are not specifically mentioned, paint them the same as adjacent similar materials or areas.

1.03 PAINTING NOT INCLUDED:

- A. The following categories of work are not included as part of the field-applied finish work, or are included in other sections of these specifications:
1. Shop Priming: Unless otherwise specified, shop priming of ferrous metal items is included under the various sections for structural steel, miscellaneous metal, hollow metal work, and similar items.
 2. Pre-Finished Items: Unless otherwise indicated, do not include painting when factory-finishing or installer finishing is specified for such items as (but not limited to) metal toilet enclosures, acoustic materials, casework, finished mechanical and electrical equipment including light fixtures, switchgear and distribution cabinets, but not light or power panels where exposed elevator entrance frames, doors and equipment.
 3. Concealed surfaces: Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, foundation spaces, furred areas, utility tunnels, pipe spaces, duct shafts and elevator shafts.
 4. Finished Metal Surfaces: Metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials will not require finish painting, unless otherwise indicated.
 5. Operating Parts and Labels:
 - a. Moving parts of operating units, mechanical and electrical parts such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts will not require finish painting unless otherwise indicated.
 - b. Do not paint over any code-required labels, such as Underwriters', Laboratories and Factory Mutual, or any equipment identification, performance rating, name or nomenclature plates.

1.04 SUBMITTALS:

A. Product Data:

1. For information only, submit 2 copies of manufacturer's technical information including paint label analysis and application instructions for each materials proposed for use. Transmit a copy of each manufacturer's instructions to the paint Applicator.

B. Samples:

1. Submit samples for Architect's review of color and texture only. Compliance with all other requirement is the Exclusive responsibility of the Contractor. Provide a listing of the materials and application for each coat of each finish sample.
 - a. On 12" x 12" hardboard, provide two samples of each color and material with texture to simulate actual conditions. Resubmit each samples as requested until acceptable sheen, color and texture is achieved.
 - b. On actual wood surfaces, provide two 4" x 8" samples of each stained wood finish as required. Label and identify each as to location and application.

1.05 DELIVERY AND STORAGE:

- A. Deliver all materials to the job site in original, new and unopened packages and containers bearing manufacturer's name and label, and the following information:

1. Name or title of material.
2. Fed. Spec. Number, if applicable.
3. Manufacturer's stock number and date of manufacturer.
4. Manufacturer's name.
5. Contents by volume, for major pigment and vehicle.

6. Constituents.
7. Thinning instructions.
8. Application instructions.
9. Color name and number.

1.06 JOB CONDITIONS:

- A. Apply water-base paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 50 degrees F. and 90 degrees F., unless otherwise permitted by the paint manufacturer's printed instructions.
- B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 45 degrees F. and 95 degrees F. unless otherwise permitted by the paint manufacturer's printed instructions.
- C. Do not apply paint in snow, rain, fog or mist; or when the relative humidity exceed 85% or to damp or wet surfaces; unless otherwise permitted by the paint manufacturer's printed instructions.
 1. Painting may be continued during inclement weather only if the areas and surfaces to be painted are enclosed and heated within the temperature limits specified by the paint manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.01 COLORS AND FINISHES:

- A. Prior to beginning work, the Architect will furnish color chips for surfaces to be painted. Colors will vary from wall to ceiling and from room to room. Final selection for gloss level will be by Architect and may not necessarily be the same as scheduled.
 1. Use representative colors when preparing samples for review.
 2. Final acceptance of colors will be from samples applied on the job.

- B. Color Pigments: Pure, non-fading, applicable types to suite the substrates and service indicated.
- C. Paint Coordination: Provide finish coats which are compatible with prime paints used. Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Upon request from other trades, furnish information on characteristics of finish materials proposed for use, to ensure compatible prime coats are used. Provide barrier coats over incompatible primers or remove and reprime as required. Notify the Architect in writing of any anticipated problems using specified coating systems with substrates primed by others.

2.02 INTERIOR PAINTING SCHEDULE:

- A. Concrete Masonry Surfaces (Semi-Gloss)(Vinyl Acrylic Latex System)
 - 1. Primer: Vinyl Acrylic Block Filler
S-W: ProMar Interior/Exterior Block Filler, B25W25.
PPG: Aquapon7 WB Polyamide-Epoxy #98-Line Series
Standard: A-7012 Interior/Exterior Latex Block Filler
 - 2. Finish Coats: Vinyl Acrylic Semi-Gloss Enamel (25-35 units at 60 degrees F.), 1.5 DFT/coat.
S-W: (2 coats) ProMar 200 Interior Latex Semi-Gloss Enamel, B31W200.
PPG: (1 coat) Aquapon7 WB Polyamide-Epoxy #98 - Line Series
Standard: A-7010 Stanaglo Latex Semi-Gloss
- B. Concrete Masonry Surfaces (Semi-Gloss): (Water Based Epoxy - Normal Exposure)
 - 1. Primer: 100 percent Acrylic Resin Block Filler, .075 - 1.0 DFT/coat.
S-W: Heavy Duty Block Filler, B42W46.
PPG: Speedhide7 Latex Masonry Block Filler #6-7
Standard: A-7012 Interior/Exterior Latex Block Filler

2. Finish Coats: Water Based Epoxy, Semi-Gloss (20-30 units at 60 degrees F.) 3 mils DFT/coat.
S-W: (2 coats) Water Based Catalyzed Epoxy, B70/B60V25.
PPG: (2 coats) Pitt-Glaze7 High Solids Semi-Gloss Acrylic-Epoxy #16-900 Series
Standard: (2 coats)Hydro-Glaze Water Based Epoxy
- C. Metal-Ferrous (Semi-Gloss): (Alkyd Enamel System, Maximum VOC content 450 grams/liter)
1. Primer: Modified Alkyd Resin Primer, 3 mils DFT/coat
S-W: Kem Kromik Universal Metal Primer, B50Z
PPG: Speedhide7 Inhibitive Primer #6-208 red or #6-212 white
Standard: Hydro-Prime
 2. Finish Coats: Alkyd Enamel, Semi-Gloss (40-50 units at 60 degrees F.) 3.0 mils DFT/coat.
S-W: (2 coats) Alkyd Enamel, Semi-Gloss B34W200.
PPG: (2 coats) Speedhide7 Alkyd Semi-Gloss #6-1110 Series
Standard: A-7067 Workrite Vinyl Acrylic Semi-Gloss
- D. Metal - Galvanized (Semi-gloss): Code #5.13 (Acrylic Latex System)
1. Finish Coats: 100 percent Acrylic, Waterborne, Semi-Gloss (30-40 units at 60 degrees F.) 3.0 mils DFT/coat.
S-W: (2 coats) DTM Acrylic coating, B66W200.
PPG: (2 coats) Pitt-TechJ Open Pack DTM Waterborne Satin Enamel #90-474 Series
Standard: A-7010 Stanoglo Semi-Gloss Enamel
- E. Gypsum Board (Semi-Gloss): (Water Based Epoxy System)
1. Primer: Vinyl Acrylic Latex, 1.1 mils DFT/coat
S-W: ProMar 200 Latex Wall Primer, B28W200.
PPG: Speedhide7 Latex Primer-Sealer #6-2
Standard: A-7013 Vinyl Primer

2. Finish Coats: Water Based Catalyzed Epoxy, Semi-Gloss (20-30 units at 60 degrees F.), 2.5 - 3.0 mils DFT/coat.
S-W: (2 coats) Water Based Catalyzed Epoxy, P60V25.
PPG: (2 coats) Pitt-Glaze 7 High Solids Semi-Gloss Acrylic-Epoxy #16-900 Series
Standard: Hydro-Glaze Water Borne Epoxy

PART 3 - EXECUTION

3.01 INSPECTION:

- A. Applicator must examine the areas and conditions under which painting work is to be applied and notify the General Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Applicator.
- B. Starting of painting work will be construed as the Applicator's acceptance of the surfaces and conditions within any particular area.
- C. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to the formation of a durable paint film.

3.02 SURFACE PREPARATION:

- A. General:
 1. Perform preparation and cleaning procedure in strict accordance with the paint manufacturer's instructions and as herein specified for each particular substrate condition.
 2. Remove all hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary for the complete painting of the items and adjacent surfaces. Following completion of painting of each space or area, reinstall the removed items by workmen skilled in the trades involved.

3. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program the cleaning and painting so that contaminants from the cleaning process will not fall onto wet, newly-painted surfaces.

B. Cementitious Materials:

1. Prepare cementitious surfaces to be painted by removing all efflorescence, chalk, dust, grease, oils, and by roughening as required to remove glaze, conforming to SSPC13.
2. Determine the alkalinity and moisture content of the surfaces to be painted by performing appropriate tests. If the surfaces are found to be sufficiently alkaline to cause blistering and burning of the finish paint, correct this condition before application of paint. Do not paint over surfaces where the moisture content exceeds that permitted by the manufacturer's printed directions.

C. Ferrous Metals:

1. Clean ferrous surfaces, which are not galvanized or shop-coated of oil, grease, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning conforming to SSPC SP-1 and NACE-No. 4, SSPC SP-2, SSPC SP-3 or SSPC SP-7 (brush off blast cleaning).

D. Galvanized Surfaces:

1. Clean free of oil and surface contaminants with an acceptable non-petroleum based solvent per SSPC SP-1.

3.03 MATERIALS PREPARATION:

- A. Mix and prepare painting materials in accordance with manufacturer's directions.
- B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing and application of paint in a clean condition, free of foreign materials and residue.

- C. Stir materials before application to produce a mixture of uniform density and stir as required during the application of the materials. Do not stir surface film into the material. Remove the film and if necessary, strain the material before using.

3.04 APPLICATION:

A. General:

1. Apply paint in accordance with the manufacturer's directions. Use applicators and techniques best suited for the substrate and type of material being applied.
2. Apply additional coats when undercoats or other conditions show through the final coat of paint, until the paint film is of uniform finish, color and appearance. Give special attention to insure that all surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
3. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Paint surfaces behind permanently-fixed equipment or furniture with prime coat only before final installation of equipment.
4. Paint interior surfaces of ducts where visible through registers or grilles with a flat, non-specular black paint.
5. Paint the back sides of access panels and removable or hinged covers to match the exposed surfaces.
6. Sand lightly between each succeeding enamel coat.
7. Omit the first coat (primer) on metal surfaces which have been shop-primed and touch-up painted, unless otherwise indicated.

B. Scheduling Painting:

1. Apply the first-coat material to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
2. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

C. Minimum Coating Thickness:

1. Apply each material at not less than the manufacturer's recommended spreading rate to establish a total dry film thickness as indicated or, if not indicated, as recommended by coating manufacturer.

D. Mechanical and Electrical Work:

1. Painting of mechanical and electrical work is limited to those items exposed in occupied spaces and includes all exterior exposed work.

E. Prime Coats:

1. Apply a prime coat of material which is required to be painted or finished, and which has not been prime coated by others.
2. Recoat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.

F. Pigmented (Opaque) Finishes:

1. Completely cover the provide an opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfections will not be acceptable.

G. Completed Work:

1. Match approved samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

3.05 CLEAN-UP AND PROTECTION:

A. Clean-up:

1. During the progress of the work, remove from the site all discarded paint materials, rubbish, cans and rags at the end of each work day.
2. Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care no to scratch or otherwise damage finished surfaces.

B. Protection:

1. Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing and repainting, as acceptable to the Architect.
2. Provide "Wet Paint" signs as required to protect newly-painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.
3. At the completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces.

END OF SECTION 09900

SECTION 10160 - TOILET PARTITIONS

PART 1 - GENERAL

1.01 SUBMITTALS:

- A. Plastic compartment work includes the following, where indicated:
 - 1. Floor mounted overhead-braced compartments.
- B. Furnish all labor and materials necessary for the completion of work in this section as shown on the contract drawings and specified herein.
- C. Work in this section shall include, but is not limited to:
 - 1. Toilet compartments, compartment doors.
 - 2. Hardware for toilet compartments.
 - 3. Shop drawings and working drawings.
 - 4. Manufacturer's guarantee/warranty.
- D. Related work specified elsewhere shall include accessories and anchorage/blocking for attachment of partitions.

1.02 PRODUCT:

- A. Submit (3) three sets of shop drawings and details for Architect's approval.
- B. Colors shall be selected from the manufacturer's full range of colors.
- C. Submit 6" square color samples of each color and hardware samples for approval by the Architect.

PART 2 - PRODUCTS

2.01 MANUFACTURER:

- A. Provide toilet partitions and screens by one of the following manufacturer's:
 - 1. SCRANTON PRODUCTS (Santana/Comtec/Capitol) Scranton, PA.
 - 2. Legacy Polymer Products, Inc., Poly Series, Dunmore, PA.
 - 3. Bradmar Solid Plastic Partitions, Mills Partitions, Bradley Corp., Menomonee Falls, WI.

2.02 MATERIALS:

- A. Doors, panels, pilasters and privacy screens and supports shall be 1" thick constructed from High-Density Polyethylene (HDPE) resins. Partitions and privacy screens shall be fabricated from polymer resins compounded under high pressure, forming a single component which is waterproof, nonabsorbent and has a self-lubricating surface that resists marks from pens, pencils, markers and other writing instruments. All plastic components shall be covered with a protective plastic masking.

2.03 CONSTRUCTION:

- A. Doors, panels, pilasters and privacy screens shall be 1" thick with all edges rounded to a ¼" radius.
- B. Doors and dividing panels shall be 55" high and mounted at 14" above the finished floor. Fasten an aluminum heat sink to the bottom edges.
- C. Pilasters shall be 82" high (standard) and fastened into a 3" high pilaster shoe with a stainless steel, torx head sex bolts.

2.04 HARDWARE:

- A. Door hardware shall be as noted:
 - 1. Hinges shall be integral, fabricated from the door and pilaster with no exposed metal parts, adjustable in 30 degree increments to hold door open up to 90 degrees.
 - 2. Door strike/keeper shall be 6" long and made of heavy-duty extruded aluminum (6436-T5 alloy) of either an anodized finish or a bright dipped anodized finish, with wrap around flanges and secured to the pilasters with stainless steel, torx head sex bolts. Bumper shall be made of extruded black vinyl.
 - 3. Latch and housing shall be made of heavy-duty extruded aluminum (6463-T5 alloy). The latch housing shall have either an anodized finish or a bright dipped anodized finish, and the slide bolt and button shall have a black anodized finish.
 - 4. Each door shall be supplied with one coat bumper/hook and 2 door pulls made of chrome plated zamak. Outswing doors shall be supplied with a door stop made of chrome plated zamak.

- B. Plaster shoes shall be 3" high (type 304, 20 gauge) stainless steel. Pilaster shoes shall be secured to the pilaster with a stainless steel, torx head sex bolt.
- C. Wall brackets for partitions shall be 1½" stirrup type made of heavy-duty aluminum (6463-T5 alloy) with either an anodized or a bright dipped anodized finish. Stirrup brackets shall be fastened to pilasters and panels with stainless steel, torx head sex bolts.
- D. Headrail shall be made of heavy-duty extruded aluminum (6463-T5 alloy) with anti-grip design and integrated curtain track. The headrail shall have an anodized finish and shall be fastened to the headrail bracket by a stainless steel, torx head sex bolt, and fastened to the top of the pilasters with stainless steel, tamper resistant torx screws.
- E. Headrail brackets shall be of heavy duty extruded aluminum with an anodized finish or 20 gauge stainless steel with a satin finish, and secured to the wall with #14 stainless steel screws.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. Examine areas to receive toilet partitions/compartments for correct height and spacing of anchorage/bolting and plumbing fixtures that may affect installation of partitions/compartments. Report any discrepancies to the Architect.
- B. Take complete and accurate measurements of complete toilet compartment locations.
- C. Start of work constitutes acceptance of job.

3.02 INSTALLATION:

- A. Install partitions rigid, straight, plumb, and level, with plastic laid out as shown on shop drawings and manufacturer's installation instructions.
- B. All doors and panels to be mounted at 14" above finished floor.
- C. Clearances at vertical edges of doors shall be uniform top to bottom and shall not exceed 3/8".

- D. Clearances at pilasters and panels shall be uniform top to bottom and shall not exceed $\frac{1}{2}$ "
- E. Clearances between panels and walls shall be uniform top to bottom and shall not exceed 1".
- F. No evidence of cutting, drilling, and/or patching shall be visible on the finished work.
- G. Finished surface shall be cleaned after installation and be left free of all imperfections.

3.03 WARRANTY:

- A. Submit manufacturer's standard guarantee for HDPE plastic against breakage, corrosion, and delamination under normal conditions for 15 years from the date of receipt by the customer. If materials are found to be defective during that period for reasons listed above, the materials will be replaced free of charge. (Labor not included in warranty).

END OF SECTION 10160

SECTION 10800 - TOILET ACCESSORIES

PART I - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this Section.

1.02 DESCRIPTION:

- A. The extent of each type of toilet accessory is shown on the drawings.
- B. The type of toilet accessories required, provided by the Owner and installed by the Contractor, include the following:
 - 1. Toilet tissue dispensers
- C. The type of toilet accessories to be provided and installed by the Contractor include the following:
 - 1. Mirrors
 - 2. Grab bars - Toilet
 - a. Fixed
 - b. Swing up
 - 3. Grab bars - Shower
 - 4. Grab bars - Urinal
 - 5. ADA Shower Seat
 - 6. Clothes Hooks
 - 7. Recessed Soap Dish
 - 8. Shower/Privacy Curtains & Track
 - 9. Stainless Steel Shelf
 - 10. Miscellaneous Accessories

1.03 QUALITY ASSURANCE:

A. Inserts and Anchorages:

1. Furnish inserts and anchoring devices which must be built into masonry for the installation of toilet accessories. Coordinate delivery with other work to avoid delay.
2. See masonry sections of these specifications for installation of inserts and anchorage devices.

B. Products:

1. Provide products of the same manufacturer for units exposed in the same areas, unless otherwise acceptable to the Architect.
2. Stamped names or labels on exposed faces of units will not be permitted, except where otherwise indicated.
3. Provide locks where indicated, with the same keying for each type of accessory units in the project wherever possible. Furnish two keys for each lock.

C. The specifications indicated specific products of one manufacturer to communicate design intent. Other manufacturers offering products to comply with the requirements for toilet accessories include the following:

1. American Specialties, Inc.
2. Accessory Specialties, Inc.
3. Bradley Corporation
4. Bobrick

1.04 SUBMITTALS:

A. Product Data:

1. For information only, submit four (4) copies of manufacturer's technical data and installation instructions for each toilet accessory. Transmit copies of installation instructions to the Installer.

B. Samples:

1. When requested, submit full-size samples of units to Architect for review of design and operation. Acceptable samples will be returned and may be used in the work. Compliance with all other requirements is the exclusive responsibility of the Installer.

C. Setting Drawings:

1. Provide setting drawings, templates, instructions and directions for installation of anchorage devices in other work.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Stainless Steel: AISI, Type 302/304 with polished No. 4 finish, 0.034 inch (22 gauge) minimum thickness.
- B. Brass: Unleaded, flat products, ASTM B19; rods, shapes, forgings, and flat products with finished edges, ASTM B16; castings, ASTM B30.
- C. Sheet Steel: Cold rolled, commercial quality, ASTM A336, 0.04 inch (20 gauge) minimum. Surface preparation and metal pretreatment as required for applied finish.
- D. Galvanized Steel Sheet: ASTM A527, G60.
- E. Chromium Plating: Nickel and chromium electro-deposited on base metal, ASTM B456, Type SC2.
- F. Mirror Glass: Nominal 6.0mm (0.23 inch) thick, conforming to ASTM C1036, Type I, Class 1, Quality q2, and with silvering electro-plated copper coating, and protective organic coating.
 1. Provide tempered glass, unless indicated otherwise.
- G. Galvanized Steel Mounting Devices: ASTM A153, hot-dip galvanized after fabrication.
- H. Fasteners: Screws, bolts, and other devices of same material as accessory unit, or of galvanized steel where concealed.

2.02 MIRRORS

- A. Stainless Steel Framed Mirror: Mirror shall have a one piece, Type 304 stainless steel angle frame, 3/4 inch by 3/4 inch with continuous integral stiffener on all sides and beveled front to hold frame tightly against mirror; corners shall be heliarc welded, ground and polished smooth; all exposed surfaces shall have satin finish with vertical grain. Tempered glass mirror shall be guaranteed for 15 years against silver spoilage. All edges shall be protected by plastic filler strips and the back shall be

protected by full size, shock absorbing, water resistant, nonabrasive, 1/8 inch thick polyethylene padding. Galvanized steel back shall have integral hanging brackets for mounting on concealed rectangular wall hanger(s). Mirror shall be secured to hanger(s) with concealed phillips head jocking screws located in bottom of frame.

1. Manufacturers: Subject to compliance with requirements, provide mirror unit by one of the following:
 - a. Bradley 740-2. Provide with tempered glass.

2.03 GRAB BARS

- A. Stainless Steel Type: Provide grab bars with wall thickness not less than 18 gauge and as follows:
 1. Mounting: Concealed, manufacturer's standard flanges and anchorages.
 2. Clearance: 1-1/2 inch clearance between wall surface and inside face of bar.
 3. Gripping Surfaces
 - a. Satin finish unless noted otherwise.
 4. Heavy Duty Size: Outside diameter of 1-1/4 inches minimum.
- B. Grab bar shall be constructed of Type 304 stainless steel with satin finish. Concealed mounting flanges shall be 11 gauge stainless steel plate, 3-1/8 inch diameter, and each shall have 2 screw holes for attachment to wall unless noted otherwise. Flange covers shall be 22 gauge, 3-1/4 inch diameter by 5/8 inch deep, and shall snap over mounting flange to conceal mounting screws. Ends of grab bars shall pass through concealed mounting flanges and be heliarc welded to form one structural unit. Grab bars shall comply with ADA Accessibility Guidelines for structural strength. Provide concealed anchor device or backing as specified or required in accordance with local building codes before wall is finished.

1. Manufacturers: Subject to compliance with requirements, provide grab bars by one of the following:
 - a. Toilet Compartments: Bradley 812-4
 1. Horizontal: 812-4 by 36"
 2. Horizontal: 812-4 by 42"
 3. Vertical: 812-4 by 18"
 - b. Swing up grab bars: Provide one of each at each toilet not in a compartment.
 1. Horizontal: 8370-103 (provide with toilet tissue dispenser)
 2. Horizontal: 8370-101
 - c. Shower Stall: Bradley 812-4.
 1. Horizontal/Backwall: 812-4 by 30".
 2. Horizontal/Sidewall: 812-4 by 48"
 3. Vertical: 812-4 by 18"
 - d. Urinal
 1. Vertical 812-4 by 18"

2.04 ADA SHOWER SEAT

- A. Folding shower seat shall have a frame constructed of 1" dia. type 304, 18 gauge satin finish stainless steel with a 16 gauge stainless wall bracket with stainless steel piano hinges, with a 16 gauge steel retaining bracket with a positive bullet-type catch to hold seat securely in either the up or down position. Seat shall be constructed of blow-molded polyethylene, containing an antimicrobial agent homogeneously distributed throughout the plastic matrix. Seat secured to 1" dia., 18 gauge stainless steel tubing. Support leg locks into 16 gauge retaining bracket with bullet-type catch. Shower seat shall meet or exceed ADA guidelines.
 1. Bradley Model 956 LH seat as indicated on drawings.

2.05 CLOTHES/HAT HOOKS

- A. Surface mounted clothes/hat hook shall be constructed of type 304, 18 gauge stainless steel with satin finish. Hooks shall be 14 gauge stainless steel.
 1. Bradley 9943

2.06 SOAP DISH

- A. Recessed heavy-duty stainless steel soap dish shall be constructed of type 304 20 gauge stainless steel with satin finish. Soap dish and flange shall be drawn and beveled, with one-piece, seamless construction. Unit shall be equipped with recessed wall clamp.

- 1. Bradley 9403 altered for masonry wall installation.

2.07 SHOWER/PRIVACY CURTAINS

- A. Curtains as manufactured by Imperial Fastener Company, Pompano Beach, FL 1-954-782-7130. Mount IFC-69 jiffy curtain track to gypsum board ceiling. Space safety tabs at 4" o.c. Provide Sure-Check shower curtain. Color as selected by Architect from manufacturer's standard colors. Provide track with aperature.

- 1. Optitrac CE5000-AN with CE6026 pop out carriers and super bio stat curtain as manufactured by the InPro Corp., Muskego, WI, 1-800-222-5556.

2.08 STAINLESS STEEL SHELF

- A. Surface Mounted shelf shall be fabricated of type 304, 18 gauge stainless steel with exposed surfaces in satin finish and integral end brackets. Shelves over 24" long shall have 16 gauge intermediate support brackets of matching stainless steel.

- 1. Bradley Model No. 7512-36.

2.09 MISCELLANEOUS ACCESSORIES

- A. Fasteners and Anchors

- 1. Provide mounting kits with stainless steel screws for accessories requiring same.
 - 2. Mounting kits shall include toggle nuts for hollow walls and expansion shields for solid walls. Provide 2 fasteners at each mounting plate.
 - 3. Provide 12 gauge, 3 inches wide, steel concealed anchor plates with tapped holes for installation of grab bars on walls constructed with metal studs.
 - 4. Provide concealed anchors for installation of grab bars on solid walls. Anchor assembly shall consist of tapped 12 gauge anchor plate, 10 gauge back plate, and 3/8 inch diameter thru-wall bolt.

PART 3 - EXECUTION

3.01 INSPECTION:

- A. Installer must examine the areas and conditions under which toilet accessories are to be installed and notify the General Contractor in writing, of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.02 INSTALLATION:

- A. Use concealed fastenings wherever possible.
- B. Provide anchors, bolts and other necessary anchorages and attach accessories securely to walls and partitions in locations as shown or directed.
- C. Install concealed mounting devices and fasteners fabricated of the same materials as the accessories, or of galvanized steel, as recommended by manufacturer.
- D. Install exposed mounting devices and fasteners finished to match the accessories.
- E. Provide theft-resistant fasteners for all accessory mountings.
- F. Secure toilet room accessories in accordance with the manufacturer's instructions for each item and each type of substrate construction.
- G. Schedule

1. Girls Toilet #106

- a. 1¼ inch diameter grab bars, 18 inch, 36 inch and 42 inch lengths (1) each
- b. Toilet Tissue Dispenser
- c. Mirror (24" x 36") tempered glass (1)
- d. Swing up grab bars with toilet paper dispenser (2)
- e. Swing up grab bars (2)
- f. Coat/hat hooks (1)
- g. Surface mounted stainless steel shelf (1)
- h. Shower/Privacy curtain (2) total

2. Boys Toilet #107

- a. 1¼ inch diameter grab bars, 18 inch, 36 inch and 42 inch lengths (1) each
- b. Toilet Tissue Dispenser
- c. Mirror (24" x 36") tempered glass (1)
- d. Swing up grab bars with toilet paper dispenser (1)
- e. Swing up grab bars (1)
- f. Coat/hat hooks (1)
- g. Surface mounted stainless steel shelf (1)
- h. Shower/Privacy curtain (2) total
- i. Vertical grab bars (@urinal) 18 inch (2)

3. Shower #108

- a. 1¼ inch diameter grab bars 18 inch, 30 inch and 48 inch lengths (1) each (Shower)
- b. Heavy Duty recessed soap dish (1) total
- c. ADA Shower seat (1) total
- d. Coat/hat hook (1) total
- e. Shower curtain (2) total
- f. Surface mounted stainless steel shelf(1)
- g. Mirror (24" x 36") tempered glass (1)

END OF SECTION 10800

SECTION 10999 - MISCELLANEOUS SPECIALTIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this Section.

1.02 DESCRIPTION OF WORK:

- A. The extent of miscellaneous specialties is as shown on the drawings or schedules and includes the following:
 - 1. Fold down nurses station
 - 2. Urinal bottle storage racks
 - 3. Adult changing station

1.03 SUBMITTALS:

A. Product Data:

- 1. Submit two (2) copies of manufacturer's specifications and installation instructions for each type of specialty required. Indicate by transmittal that copy of each instruction has been distributed to the Installer.

B. Samples:

- 1. Submit three (3) samples of each color and finish of exposed materials and accessories required for each specialty. Architect's review of samples will be for color and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor.

C. Shop Drawings:

- 1. Submit shop drawings for fabrication and erection of specialties, including plans, elevations and large scale details, shop anchorages and accessory items. Provide location template drawings for items supported or anchored to permanent construction.

PART 2 - PRODUCTS

2.01 PREFABRICATED PRODUCTS:

A. Fold Down Nurses Station

1. Model No. Wallaroo 2000 XD as manufactured by Carstens, 7130 Wilson Avenue, Chicago, IL 60706, 1-800-782-1524, www.carstens.com
2. Station is constructed of:
 - a. .032 cold rolled steel writing surface (inner door), chassis.
 - b. .048 cold rolled steel - upper door, upper and lower caps.
 - c. Side panels: ABS plastic.
3. Finish of steel components: Powder-coated baked.
4. Weight: 55.2 lbs empty. 66 lbs. with maximum probable accessories.
5. Color as selected by Architect from manufacturer's standard colors.
6. Quantity: (3) three + (1) one in girls POHI toilet, (1) one boys POHI toilet and (1) one in shower.

B. Urinal Bottle Storage Racks

1. Manufacturer: Emery Industries, 31 Demand Avenue, Arundel, QLD 4214, Australia 61-755-948-400, website: sales@emeryindustries.com.au
 - a. Model No. : SS104-6U
 - b. Construction: Stainless steel-welded
 - c. Shelves: Hanging trip tray
 - d. Wall mounted
 - e. Dimensions: 31½" (800mm) x 4¾"D (120mm) x 8¼"H (210mm)
 - f. Storage capacity: (6) urinal bottles
 - g. Quantity: (2) two install per manufacturers specs in locations indicated on drawings.

C. Adult Changing Station

1. Materials:
 - a. Body 16 gauge Type 304 brushed stainless steel, seamless welds.
 - b. Tray liner-polystyrene, replaceable
 - c. Safety belt: smooth nylon, cleanable, cam-buckle, adjustable with one hand.
 - d. Pneumatic gas cylinders for smooth, safe open and close motions.
 - e. Hinges: stainless steel
2. Rating: Static load of 400 lbs. (181kg) exceeds ASTM F2285 requirements for weight bearing changing stations.
3. ADA compliant when installed per manufacturers specs.
4. Signage:
 - a. ANSI 3535.3 & Z535.4 compliant safety labels
 1. Provide with universal changing station door sign.
 2. Universal changing station plaque provided on front of unit.
5. Length: 62 inches (1575mm)
6. Warranty: manufacturers 5 year warranty against manufacturing defects.
7. Provide recessed model 100-SSE-R as manufactured by (Brocar) Foundations Worldwide, 7001 Wooster Pike, Medina, OH 44256 as distributed by Amera Products 800-608-6508 fax 409-840-5545.

PART 3 - EXECUTION

3.01 INSPECTION:

- A. Installer must examine the substrates and conditions under which the specialties are to be installed, and notify the General Contractor and Architect in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.02 INSTALLATION:

- A. In addition to the requirements of these specifications, comply with manufacturer's instructions and recommendations for preparation of substrate, installation of anchors, and application of specialties. Coordinate with work of other trades for application of inserts of other integral equipment items.
- B. Install at the locations shown or scheduled, securely mounted with concealed fasteners, unless otherwise shown. Attach to substrates in accordance with the manufacturer's instructions, unless otherwise shown.
- C. Install level, plumb and at the proper height. Cooperate with other trades for installation in finish surface. Repair or replace damaged units as directed by the Architect.

END OF SECTION 10999

SECTION 12300 - PLASTIC LAMINATE CASEWORK

PART 1 - GENERAL

1.01 General Provisions

- A. Attention is directed to Division 0, Bidding and Contract Requirements and to Division 1 General Requirements which are hereby made a part of this Specification. Refer to other sections, divisions, and schedules for work in connection with this section.

1.02 Intent

- A. The intent of this specification is to establish minimum performance and quality criteria consistent with preestablished standards of design and function. Casework not meeting these minimum requirements will be unacceptable.
- B. The casework contractor shall be held in strict compliance with any specific materials, finishes, construction details and hardware that are specified herein. Bids proposing to supply casework not meeting these requirements will be rejected.

1.03 Work Included

- A. Furnish, deliver, and install to Owner's and Architect's satisfaction, all prefabricated plastic laminate casework as shown on drawings, schedules and equipment lists.
- B. Furnish and install all fillers, scribes, finished ends, finished backs and cutouts required to provide a complete and finished project. Plastic laminate work surfaces shall include backer sheet.
- C. Provide locks on all cabinets capable of locking unless noted otherwise. All cabinets are to be keyed alike per room. All locks are to be masterkeyable to room doors.
- D. Blocking, framing, and reinforcement in walls, ceilings, and floors for anchoring of cabinets and trim.

1.05 QUALIFICATIONS

- A. Plastic laminate casework shall be as manufactured by Stevens Cabinet Co. Division of Stevens Industries Inc., Teutopolis, Illinois. Products and catalog numbers are from Stevens catalog and are used as basis for identification, configuration, size and quality.
- B. Other pre-approved manufacturers are as follows:
- TMI System Design Corp. Dickinson, North Dakota
 - Case Systems Inc., Midland, Michigan
 - LSI Corporation of America, Inc., Minneapolis, Minnesota
 - Wood Metal Industries, Selinsgrove, Pennsylvania
 - Strata Design, Inc., Traverse City, Michigan
- C. Casework of other manufacturers will be considered for approval providing written request is received at least five (5) days prior to announced bid date and approved by addendum. Bidder shall state in writing any deviations from requirements and specifications. The casework shall conform to configuration, arrangement, design, material quality, joinery, panel thickness, and surfacing of that specified and shown on drawings.
- D. Manufacturers requesting approval shall submit samples with Cut-A-Ways showing cabinet construction, joinery, door construction, hardware, and materials; along with catalogs and specification in order that accurate evaluations can be made. Samples may be impounded for the duration of contract to insure construction specification compliance.

1.06 SUBMITTALS

- A. Shop drawings shall be submitted for approval within fifteen (15) days after formal notification of award of contract. Drawings shall consist of floor plans indicating arrangement and adjacent work and equipment, and complete elevations of casework.
- B. Color samples shall be submitted for selection and coordination at time of contract award. Samples of actual material and color shall be available as required.

- C. Additional catalog cuts, details and samples as requested by Architect for evaluation and coordination.
- D. Physical sample must be approved prior to fabrication.

1.07 PRODUCT DELIVERY AND STORAGE

- A. Protect cabinet during transit, delivery, storage and handling to prevent damage, soiling and deterioration.
- B. Store cabinets at project site installation and storage areas with similar ambient conditions as final installation. Storage areas must be kept dry, heated with low relative humidity and away from construction work such as painting, wet work, grinding and similar operations.

1.08 WARRANTY

- A. Casework manufacturer shall provide lifetime guarantee and limited warranty to the original Owner against defective material and fabrication for as long as they own the product - this is a warranty of replacement and repair only, the manufacturer will correct defects in material and/or fabrication without additional cost.

PART 2 - PRODUCTS

2.01 CORE MATERIAL

- A. Cabinet components having particle board core material shall be of a minimum 45 lb. density, M-2 industrial grade. The particle board used shall have been tested under ANSI A208.1 1993 standards and/or ASTM D 1037-91A.
- B. Medium density fiberboard (MDF) shall be used in high stress areas as drawer members and shall be minimum 48 lb. density MD-21 grade and tested under ANSI A208.2 1994 Standards.
- C. Industrial hardboard shall be pre-finished 1/4" thickness composed of wood fibers, phenolic resin binders and moisture inhibitors that meet or exceed the hardboard product standard ANSI/AHA A135.4 1988.

2.02 SURFACE MATERIAL

- A. Exposed exteriors shall be permanently thermofused melamine laminate, fused to core using a minimum average pressure of 320 PSI and average 320 degree F. temperature. Thermofused melamine laminate shall meet ALA 1996 specification standards, as tested against the high pressure laminate NEMA LD 3-1995, VGS.028 specification standards. (Warranted for life against delamination).
- B. Exposed doors shall be permanently thermofused melamine laminate, fused to core using a minimum average pressure of 320 PSI and average 320 degree F. temperature. Thermofused melamine laminate shall meet ALA 1996 specification standards, as tested against the high pressure laminate NEMA LD 3-1995, VGS.028 specification standards, (Warranted for life against delamination).
- C. Exposed interiors shall be permanently thermofused melamine laminate, fused to core using a minimum average pressure of 320 PSI and average 320 degree F. temperature. Thermofused melamine laminate shall meet ALA 1996 specification standards, as tested against the high pressure laminate NEMA LD 3-1995, VGS.028 specification standards. (Warranted for life against delamination).
- D. Semi-exposed and concealed surfaces shall be permanently thermofused melamine laminate or high pressure decorative plastic laminate cabinet liner, 0.020" thickness for balanced construction. Thermofused melamine laminate shall meet the ALA 1996 specifications standard, as tested against the high pressure laminate NEMA LD 3-1995, VGS.028 specification standards.

2.03 EDGINGS

- A. Exposed exterior cabinet front edges shall be banded with a contrasting or matching rigid PVC extrusion, 0.020" thickness, resistant to chip, crack and high impact. Edging shall have a satin finish with a UV cured top coat for additional durability. The 0.020" thick edging shall be applied with waterproof hot melt adhesive.

- B. Door front edges shall be banded with a contrasting or matching rigid PVC extrusion, 3mm (1/8") thickness, resistant to chip, crack, and high impact. Edging shall have a satin finish with UV cured top coat for additional durability. The 3mm thick edging shall be applied with waterproof hot melt adhesive, and shaped to provide radiused edges and radiused corners.
- C. Adjustable shelves shall be banded with PVC extrusion, resistant to chip, crack, and high impact. Edging shall have a satin finish with a UV cured top coat for additional durability. Edging shall be applied with waterproof hot melt adhesive. Shelves to be 1" thick. 0.020" thick PVC edging shall be applied to four (4) edges of adjustable shelf.

2.04 COLOR SELECTIONS

- A. Exposed cabinet exteriors shall be chosen from Thermofused melamine laminate selections as depicted in manufacturer's color selector guide. A minimum of seventy (70) colors and patterns shall be available as standard selection.
- B. Exposed door fronts shall be chosen from Thermofused melamine laminate selections as depicted in manufacturer's color selector guide. A minimum of seventy (70) colors and patterns shall be available as standard selection.
- C. Semi-exposed surfaces, including drawer box components, shall be finished in either pearl or grey as selected from casework manufacturer's standard interior color selections.
- D. Exposed interior components, including both faces of shelves and interior face of backs to match exposed cabinet exterior color selection.
- E. Door edges shall be chosen from one of twenty-two (22) trim group colors in 3mm thick PVC in contrasting or matching colors as depicted in manufacturer's color guide.
- F. Exposed front edge of cabinet, including exposed interior edges, shall be selected from one of seventy (70) trim group colors in 0.020" thick PVC in contrasting or matching colors as depicted in manufacturer's color guide, or commercial match to selected exposed exterior color based on availability.

- G. Semi-exposed edges of cabinet components including drawers, shall be either pearl or grey n 0.020" thick PVC.
- H. Pulls shall be available in chrome, brass, bent wire and injection molded pulls in either bent wire or contour design, to be available in twenty (20) colors as selected from manufacturer's color selector.
- I. Casework of substitute brands with lesser amounts or more restrictive selection requirements will not be considered equal and shall be rejected.
- J. Finishes to be laminate manufacturer's matte, suede, or equivalent finish as approved by Architect. Samples will be reviewed by Architect for color, texture, and pattern only.

2.05 HARDWARE

A. Hinges

1. Institutional five-knuckle secured with minimum of eight screws. Hinge plate must extend into cabinet a minimum of 2 1/4" (56 mm) in order to assure maximum strength. Finish to be powder-coated baked on black enamel or brushed chrome US26D.

a. Two hinges used on all doors less than 48" (1220 mm) in height, three hinges used on all doors 48" (1220 mm) or greater in height. Hinge to accommodate 13/16" (21 mm) door.

B. Door catches shall be a heavy-duty spring loaded, large diameter (17.5mm - 11/16") roller type catch mounted at bottom edge. All doors over 48" in height shall be provided with roller catch at both top and bottom of door.

C. Catch strike plate shall be injection molded ABS, with an integrally molded engagement ridge. Strike plate shall also provide a wide face bumper insuring a positive door stop.

D. Pulls shall be impact resistant injection molded bent wire, 4" length available per color selection in Article 2.04.H.

- E. Shelf support clips for 1" thick adjustable shelves shall be injection molded clear polycarbonate. Support clips shall incorporate integral molded lock tabs to retain shelf from topping or inadvertently being lifted out. Support clip shall have 5mm dia. double pin engagement into precision bored hole pattern in cabinet vertical members. Clips shall have a molded ridge which provide pressure against edge of shelving to maintain positive pin engagement. Clip shall be designed in such a manner to provide means for permanent retention to shelf. Static test load must exceed 200lb. per clip.
- F. Locks shall be cylinder type, diecast, with five (5) disc tumbler mechanism. Each lock shall be provided with milled brass key. Master key cabinets to room doors. Cabinets with multiple locks installed shall be keyed alike by room, with each cabinet in that room keyed the same unless otherwise specified. Locks shall be Remov-A-Core to give flexibility for different pass key options. Locks shall be provided on all cabinets capable of locking.

2.06 COMPONENTS

- A. Wall cabinet ends shall be 3/4" thick particle board, laminated for balanced construction, surfaced as described in Article 2.02.A and edged as described in Article 2.03.A.
- B. Wall cabinet top and bottom shall be 1" thick particle board, laminated for balanced construction, surfaced as described in Article 2.02.C, and edged as described in Article 2.03.A.
- C. Vertical cabinet members shall be 3/4" thick particle board, laminated for balanced construction, surfaced as described in Article 2.02.C, and edged as described in Article 2.03D.
- D. Cabinet backs shall be 1/4" thick pre-finished industrial hardboard.
- E. Frame rails shall be 3/4" thick x 3 3/4" wide particle board, laminated for balanced construction, surfaced as described in Article 2.02.C, and edged as described in Article 2.03.A.

- F. Mounting rails shall be 3/4" thick x 3 3/4" wide particle board. Wall cabinets shall have rails positioned at the top and bottom.
- G. Adjustable shelves shall be 1" thick. Edges of shelf shall be banded as described in Article 2.03.C with a high impact, rigid PVC extrusion, pearl or grey in color.
- H. Solid hinged doors shall be 3/4" thick material of balanced construction, surfaced as described in Section 2.02.B, edged as described in Article 2.03.B.

2.07 CONSTRUCTION

- A. Cabinet parts shall be accurately machined and precision bored for premium grade quality joinery construction, utilizing automatic machinery to ensure consistent sizing on modular cabinets. Cabinets shall be assembled under controlled case clamp conditions, assuring final cabinet squareness and proper joint compressions.
- B. Cabinet ends shall be bored to receive 8mm, industrial grade hardwood laterally fluted dowels with chamfered ends. Cabinet ends shall be prepared to receive adjustable shelf hardware at 32mm (approximately 1 1/4") centers. Door hinges shall be machined drilled to maintain vertical and horizontal alignment of components. Inset grooving with chamfer shall be machined 3/4" from rear edge to accept the 1/4" back.
- C. Tops and bottoms shall be joined to cabinet ends using a minimum of six (6) dowels at each joint for twenty-four (24) inch deep cabinets and a minimum of four (4) dowels at each joint, for twelve (12) inch deep cabinets. All dowels to be industrial grade hardwood, laterally fluted, with chamfered ends and 8mm in diameter. Top of base cabinet will be full depth. Inset grooving with chamfer shall be machined 3/4" from rear edge to accept the 1/4" back.
- D. Frame rails shall be joined to ends with 8mm diameter hardwood dowels.
- E. Mounting rails shall be fully concealed behind backs. Rails shall be 3/4" thick and fastened to cabinet ends with 8mm hardwood dowels. Wall cabinet shall incorporate two mounting rails. Wall cabinets shall have rails positioned at top and bottom.

- F. Back panels shall be 1/4" thick and inset 3/4" from rear edge of cabinet. Back shall be glued and continuously trapped in top, bottom and ends of cabinets.

2.08 COLOR SELECTION

A. Laminate Color Selection:

- 1. Select from the full range of Wilsonart®, Nevamar®, Pionite®, Arborite® and Formica® stock color charts for cabinet faces, exposed ends, open interiors and countertops.

B. Hinge and Pull Color Selection:

- 1. Select from full range of stock and custom colors to coordinate/match: Wilsonart®, Nevamar®, Pionite®, Arborite® and Formica®.

C. Miscellaneous Hardware Color Selection (support brackets, rails):

- 1. Select from full range of stock and custom colors to coordinate/match: Wilsonart®, Nevamar®, Pionite®, and Formica®.

D. 3mm PVC Edge Banding Color Selection:

- 1. Select from full range of stock and custom colors to coordinate/match: Wilsonart®, Nevamar®, Pionite®, and Formica®.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The Installer must examine the job site and the conditions under which the work in this section is to be performed, and notify the General Contractor in writing of any unsatisfactory conditions. Do not proceed with work under this section until unsatisfactory conditions have been corrected in a manner acceptable to the installer.
- B. Casework and related materials to be conditioned to average prevailing humidity condition in installation areas prior to start of work.

- C. Install casework with factory-trained supervision authorized by manufacturer. Casework shall be installed plumb, level, true and straight with no distortions. (Shim as required). Securely attached to building structure with anchorage devices of appropriate type, size and quantity to meet applicable codes, specifications and safety conditions. Where laminate clad casework abuts other finished work, scribe and trim to accurate fit.
- D. Adjust casework and hardware so that doors operate smoothly without warp or bind. Lubricate operating hardware as recommended by the manufacturer.
- E. Repair, or remove and replace, defective work as directed upon completion of installation.
- F. Clean plastic surfaces, repair minor damage per plastic laminate manufacturer's recommendations. Replace other damaged parts of units.
- G. Advise the General Contractor of procedures and precautions for protection of casework from damage by other trades until acceptance of work by Owner.
- H. Cover casework with 4-mil polyethylene film for protection against soiling and deterioration during remainder of construction period.

END OF SECTION 12300