

City of Mt. Pleasant, Michigan

# **CONTRACT DOCUMENTS**

for

## **Reservoir Roof Replacement**



**BRUCE KILMER**

Mayor

**KATHIE GRINZINGER**

City Manager

Prepared By:  
Division of Public Works

**RANDY CHESNEY**

Interim DPW Director

February 2011

City of Mt. Pleasant, Michigan  
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THE CITY OF  
MT. PLEASANT, MICHIGAN

**CITY HALL**

320 W. Broadway • 48858-2447  
(989) 779-5300  
(989) 773-4691 fax

**PUBLIC SAFETY**

804 E. High • 48858-3595  
(989) 779-5100  
(989) 773-4020 fax

**PUBLIC WORKS**

1303 N. Franklin • 48858-4682  
(989) 779-5400  
(989) 772-6250 fax

**NOTICE TO BIDDERS**

**2011 RESERVOIR ROOF REPLACEMENT**

The City of Mt. Pleasant, Michigan, is requesting sealed bids at the Office of the City Clerk, City Hall, 320 W. Broadway Street, Mt. Pleasant, Michigan 48858, until 1:30 p.m. (local time), on Tuesday, March 15, 2011, at which time and place the bids will be publicly opened and read. All bids shall be submitted in a sealed envelope, plainly marked "Reservoir Roof Replacement – March 15, 2011".

Proposals are solicited on a lump sum basis, for the following work:

**2011 Reservoir Roof Replacement**

All bid proposals must be accompanied by a bid bond, bank cashier's check, bank draft, or certified check for not less than five percent (5%) of the bid price, made payable to the City of Mt. Pleasant.

Complete specifications are available at the Division of Public Works Building, 1303 North Franklin Street, Mt. Pleasant, Michigan 48858, 8:00 a.m. to 4:30 p.m., Monday through Friday, or can be viewed and downloaded at no charge at [www.mt-pleasant.org/depts/engineering/biddinginfo.htm](http://www.mt-pleasant.org/depts/engineering/biddinginfo.htm).

The City of Mt. Pleasant reserves the right to accept or reject any or all bids, to waive any irregularities in the bids, and to select the bid considered most advantageous to the city.

Jeremy Howard  
City Clerk

Malcolm Fox  
Water Superintendent  
(989) 779-5426

[Form05]

City of Mt. Pleasant, Michigan  
**INSTRUCTIONS TO BIDDERS**

1. **Proposals**

Proposals must be made upon the forms provided therefore, with the Bid amount both written and shown in figures, and all other data required submitted.

The Proposal, bound together with all Proposal Documents, must be enclosed in a sealed envelope marked as specified in the Notice to Bidders for such Bid and clearly indicating the name and address of the Bidder and must be received by the City Clerk, City Hall, 320 West Broadway Street, Mt. Pleasant, Michigan 48858, no later than the time and date specified in the Notice to Bidders. At such specified time, Proposals shall be publicly opened and read aloud.

2. **Basis of Proposals**

Proposals are solicited on the basis of unit price(s) and/or lump sum(s), as specified on the Proposal form.

The City of Mt. Pleasant (also referred to as "Owner"), reserves the right to accept any Bid, to reject any or all Bids, to waive any irregularities in the Bids, and to select the Bid considered most advantageous to the city.

3. **Comparison of Bids**

In comparing Bids, consideration shall be given to the time proposed for completion of the Contract, qualifications of Bidder, price differentials, alternate Proposals for the alternate items listed in the Proposal (if applicable), and any other pertinent factors. **The City of Mt. Pleasant grants a preference to businesses located within the Mt. Pleasant City Limits. The preference given is a differential above the low bid if the low bid is not from a City of Mt. Pleasant bidder. The differential allowed is 3% of the total for bids between \$5,000 and \$9,999 and 2% of the total for bids over \$10,000. The maximum credit allowed is \$1500.00.** The Owner reserves the right to make an award to the Bidder whose Proposal is deemed to be in the best interest of the Owner.

4. **Time**

Time is of the essence in the performance of the Contract, and each Bidder, by submitting a Proposal, certifies his/her acceptance of the time allowed by the Contract for the completion of the work specified.

5. **Indemnification**

The Contractor shall save and hold harmless the city and its employees from and against all claims, damages, losses, or expenses, including attorney's fees, arising out of or resulting from the performance of the work; provided that any such claim, damage, loss or expense is caused in whole or in part by any negligent or willful act of omission of the contractor, subcontractor,

employee, or anyone under their direction. The Contractor shall at his/her own expense, defend any and all such actions and shall pay all attorney's fees, costs, and expenses pertaining thereto.

6. **Bid Deposits**

Each Proposal shall be accompanied by a certified check, or a Bid Bond by a recognized Surety Company similar to a U. S. Government Standard Form Bid Bond, in the amount of five percent (5%) of the total amount of the Bid, made payable to the City of Mt. Pleasant, subject to forfeiture to the Owner in the event of failure on the part of the successful Bidder to enter into the attached form of agreement to do the work specified by said Proposal at the price and within the time stated therein. The Bid Deposit of all Bidders, except the three (3) lowest acceptable Bidders, shall be returned within two (2) weeks after opening of bids. The bid deposits of the three (3) lowest acceptable bidders shall be returned within 48 hours after the executed Contract(s) have been finally approved by the Owner.

7. **Liquidated Damages**

A liquidated damage clause, as given in the Contract form, provides that the Contractor shall pay the Owner as liquidated damages, and not as a penalty, the amount indicated in the Proposal for each and every calendar day that the Contractor may be in default of substantial completion of the work required under said Contract.

8. **Insurance and Bonds**

The successful Bidder will be required to execute (2) Bonds, in the form attached hereto, with Surety acceptable to the Owner and insurance, as follows:

- a. Bond in the amount of 100% of the Estimated Contract Price running to the City of Mt. Pleasant, Michigan, to insure the completion of the entire work, according to the statutes of the State of Michigan in effect at that time.
- b. Bond in the amount of 100% of the Estimated Contract Price running to the People of the State of Michigan for the protection of Subcontractors and Labor and Material Men, according to the statutes of the State of Michigan in effect at that time.
- c. Insurance in the amounts required by City Ordinance as specified in the Section 1 - General Construction Specifications, attached hereto.

The successful bidder shall be required to furnish for each set of executed Contract Documents, and conformed copies thereof, an original conformed Performance Bond, Labor and Materials Bond, Maintenance Bond, and Insurance Certificates.

9. **Permits and Local Codes**

The Owner shall procure the required permits for municipal sanitary sewer construction, municipal water system construction, and soil erosion control.

The Contractor shall obtain, at his/her expense, all other required local construction permits and shall comply with local building code and inspection requirements.

10. **Qualifications of Bidders**

It is the intent of the Owner to award the Contract to a Bidder fully capable, both financially and with regard to experience, to perform and complete all work in a satisfactory and timely manner. Evidence of such competency must be furnished on the forms included in the proposal, listing projects of similar difficulty, scope of work, and size, which the Bidder has satisfactorily undertaken and completed.

It is the intention of the City to award the contract to a Contractor whose ability and financial resources are fully equal to the task of performing the work in a satisfactory manner. With this in view, the Proposal calls for at least five (5) references, using specific names of persons to contact concerning the Contractor's ability to do this particular class of work. References from municipalities are preferred. The mere ability to furnish a Performance Bond shall not be accepted as sufficient evidence of responsibility on the part of the Bidder. The Bidder may also be required to furnish evidence of his current financial status.

11. **Interpretation of Documents**

If any Bidder is in doubt as to the true meaning of any part of the Plans, Specifications or any Contract Document, he/she may submit to the Owner a written request for an interpretation thereof. Any interpretation made in response to such a query shall be made only by Addendum, duly issued, and a copy of such Addendum shall be mailed or duly delivered to each prospective Bidder. The Owner shall not be responsible for any other explanation or interpretation of the Contract Documents. Alternative proposals that are suggested by bidders will be given consideration, if presented before the bid opening. If accepted, an addendum will be issued and sent out to all potential bidders, so that they may bid on the alternatives that have been identified.

12. **Execution of Bid Proposal**

A Bid Proposal, which is not signed by the individual making it, should have attached thereto a Power of Attorney evidencing authority to sign the Bid Proposal in the name of the person for whom it is signed.

A Bid Proposal, which is signed by a partnership, shall be signed by all of the partners or by an Attorney-in-Fact. If signed by an Attorney-in-Fact, there should be attached to the Bid a Power of Attorney evidencing authority to sign the Bid Proposal in the name of the partnership and such Power of Attorney shall be signed by all partners of the partnership.

A Bid Proposal, which is signed for a corporation, should have the correct corporate name thereof and the signature of the President, or other authorized officer(s) of the corporation, manually written below the corporate name and on the line indicating "By:\_\_\_\_\_." If such a Bid Proposal is manually signed by an officer other than the President of the corporation, a certified copy of a Resolution of the Board of Directors evidencing the authority of such officer(s) to sign the Bid Proposal should be attached

thereto. Such a Bid Proposal should also bear the attested signature of the Secretary of the corporation and an impression of the corporate seal.

13. **Execution of Contract**

The successful Bidder to whom an award is made shall be required to enter into a written agreement, in the form attached hereto, within ten (10) days after receipt of a Notice of Award and copies of the documents to be executed. In the event the successful Bidder fails to comply with this provision, he/she may be considered by the Owner to have abandoned all his/her rights and interests in the award and his/her certified check or amount of the Bid Bond may be declared to be forfeited to the Owner, and the Contract may be awarded to another.

14. **Bidder Responsibility For Conditions of Work and Site**

The Bidder, or his/her representative, shall make personal investigation of the site of work and of existing structures and shall determine to his/her own satisfaction the conditions to be encountered, the nature of the ground, the difficulties involved in making connections to existing structures and pipes, and any and all other factors affecting the work proposed under the Contract.

The Bidder to whom the Contract is awarded shall not be entitled to any additional compensation by reason of conditions being different from those anticipated or by reason of his/her failure to fully acquaint himself/herself with the conditions at the site affecting the work of the Contract.

15. **Changes in Work**

If any change is required to be made in the work of the Contract, a payment adjustment therefore shall be determined as specified in the "TECHNICAL SPECIFICATIONS, Section 1 - General Construction Specifications" of the Contract.

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Revised: February 2006

[Form24a]

City of Mt. Pleasant, Michigan  
**BID PROPOSAL**

**RESERVOIR ROOF REPLACEMENT**

TO: Office of the City Clerk  
City Hall  
320 W. Broadway Street  
Mt. Pleasant, MI 48858

BID DATE: March 15, 2011  
TIME: 1:30 p.m.

The undersigned, as Bidder, hereby declares that this bid is made in good faith without fraud or collusion with any person or persons bidding of the same Contract; that he has carefully read and examined the Contract Documents, including the Notice to Bidders, Instructions, Bond Forms, Technical and Detailed Specifications, and Contract Drawings, for the designated work and understands all of the same; that he, or his representative, has made such a personal investigation at the site as is necessary to determine the character and difficulties attending the execution of the proposed work; and he proposes and agrees that if this Proposal is accepted, he will contract with the Owner in the form of the Contract hereto annexed, to provide necessary machinery, tools, apparatus and other means of construction, including utility and transportation services, necessary to do all the work and furnish all the materials and equipment specified or referred to in the Contract Documents, including Addenda No. \_\_, \_\_, and \_\_, in the manner and time therein prescribed, and according to the requirements of the Owner as therein set forth to furnish Contractor Bonds and Insurance required of the Contractor by the Contract Documents, and that he will take in full payment therefore the unit prices set forth in the following Proposal.

The Bidder understands that the Owner reserves the right to reject any or all bids, and to waive any irregularities in the bidding.

The Bidder agrees that his bid shall be good and may not be withdrawn for a period of sixty (60) calendar days after the scheduled closing time for receiving the bids.

Upon receipt of a written Notice of Award of the Bid, the Bidder shall execute the formal Contract Agreement attached hereto within ten (10) days and shall deliver to the Owner a Surety Bond or Bonds required. In the event the Contract and Bond are not executed within the time above set forth, the Bid Deposit attached in the sum of five percent (5%) of the Bid Proposal shall become the property of the Owner as liquidated damages for the delay and additional expense to the Owner caused thereby.

The Bidder hereby agrees to commence work under this Contract on or before the date to be specified in the written Notice to Proceed executed by the Owner and to fully complete the project as stipulated in the Special Conditions of these Specifications. The Bidder further agrees to pay as liquidated damages the sum indicated in the Special Conditions for each consecutive calendar day thereafter, until substantial completion, that is when all work items in the proposal are complete and notification of substantial completion of work items and final quantities is given to the Director of Public Works by the contractor.

The unit prices listed below shall include all labor, materials, overhead, profit, insurance, etc., to cover the finished work of the several kinds specified, and the Bidder agrees to perform all of the work described in the Specifications and/or shown on the Plans for the following unit prices:

ITEM NO.	DESCRIPTION	UNIT PRICE	AMOUNT
1)	Reservoir Roof Replacement – 40 Mil	\$ _____	\$ _____
	Flexible Walkways - Additions or Subtractions	\$ _____	LF
	TOTAL AMOUNT FOR WORK - 40 Mil	\$ =====	(figures)
2)	Reservoir Roof Replacement – 50 Mil	\$ _____	\$ _____
	Flexible Walkways - Additions or Subtractions	\$ _____	LF
	TOTAL AMOUNT FOR WORK-50 Mil	\$ =====	(figures)
	<b>TOTAL BID:</b>	\$ =====	(figures)

\_\_\_\_\_ and \_\_\_/100 Dollars.  
(written)

RESPECTFULLY SUBMITTED,  
Company Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ ST \_\_\_\_\_ ZIP \_\_\_\_\_

Telephone \_\_\_\_\_ Fax \_\_\_\_\_

Email \_\_\_\_\_

Authorized Signature \_\_\_\_\_

Print or Type Name and Title \_\_\_\_\_

Date \_\_\_\_\_

**EXPERIENCE QUESTIONNAIRE**  
**TO BE FURNISHED BY BIDDER**  
**CITY OF MOUNT PLEASANT, MICHIGAN**

The signatory of this proposal guarantees the truth and accuracy of all statements and of all answers hereinafter made.

1. How many years have you been in business as a contractor under your present name?

2. How many years have you been a principal officer of a firm under a different name?

Name of Firm \_\_\_\_\_

3. What projects of a similar nature has your organization contracted for within the past five years? (NOTE: Fill out each blank completely.)

Name of Owner & Location	Name/Address/Phone # of Person in Charge as Reference	Type of Work	Value of Work	Date Completed
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____

City of Mt. Pleasant, Michigan  
**NOTICE OF AWARD**

TO: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

PROJECT Description: 2011 Reservoir Roof Replacement

THE CITY OF MT. PLEASANT (CITY) has considered your BID submitted March 15, 2011, for the above-described WORK in response to its NOTICE TO BIDDERS and INSTRUCTIONS TO BIDDERS.

You are hereby notified that your BID has been accepted for items in the amount of \_\_\_\_\_ Dollars and \_\_\_/100 (\$\_\_\_\_\_ -).

You are required by the INSTRUCTIONS TO BIDDERS to execute the AGREEMENT and furnish the required CERTIFICATES OF INSURANCE within ten (10) calendar days from the date of this NOTICE to you.

If you fail to execute said AGREEMENT within ten (10) days from the date of this NOTICE, said CITY will be entitled to consider all your rights arising out of the CITY'S acceptance of your BID as abandoned. The CITY will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the CITY.

Dated \_\_\_\_\_, 2011.

CITY OF MT. PLEASANT, MICHIGAN  
Owner

By: \_\_\_\_\_  
Randy Chesney, Interim Director  
Division of Public Works

**RECEIPT OF NOTICE**

Receipt of the above NOTICE OF AWARD is hereby acknowledged this \_\_\_\_\_ day of \_\_\_\_\_.

\_\_\_\_\_  
Contractor

By: \_\_\_\_\_  
Print or Type Name and Title

[Form02]

City of Mt. Pleasant, Michigan  
**AGREEMENT**  
2011 Reservoir Roof Replacement

THIS AGREEMENT, made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 2011, by and between the CITY OF MT. PLEASANT, MICHIGAN, a Michigan municipal corporation, whose principal offices are located at City Hall, 320 W. Broadway Street, Mt. Pleasant, Michigan 48858, hereinafter referred to as CITY and \_\_\_\_\_, hereinafter referred to as CONTRACTOR, for the considerations stated herein, agree as follows:

1. The CONTRACTOR agrees to forthwith perform specified services in accordance with the Specifications attached hereto and incorporated herein by reference.
2. The CITY shall pay to the CONTRACTOR, and the CONTRACTOR shall accept as full payment for the performance of this work, subject to any additions or deductions provided for, the total contract price of \_\_\_\_\_ DOLLARS and \_\_\_\_/100 (\$\_\_\_\_\_). Such payment shall be made within thirty (30) days of receipt of any invoice, pending completion and acceptance of work performed.
3. In the event of any disagreement or controversy arising between the parties hereto as to the meaning of the Specifications, the interpretation of the proper execution of this contract, the amount of work to be performed, measurements and quantities, material(s) to be used, rate of progress, or other disputes under this contract, such disagreement or controversy shall be submitted to the Mt. Pleasant Division of Public Works, and the decision of the Director of Public Works shall be final.
4. All work shall be performed in strict compliance with the Specifications attached hereto.
5. In the event the CITY determines, at any time, that the work to be performed hereunder is not being performed in a good, substantial, workmanlike or timely manner, the CITY may suspend or terminate work hereunder without any liability to the CITY.
6. It is understood and agreed that the Notice to Bidders, Proposal, Specifications, and all Addenda prepared for this project are all essential documents of this contract and are incorporated as a part of this Agreement by reference.

7. In the event that any provision of any part of this contract conflicts with the provision(s) of another part of the contract, the provisions contained in the document first listed below, when applicable, shall govern:

- a) Agreement
- b) Addenda
- c) Special Conditions of Contract
- d) Contract Drawings
- e) Approved Shop and Working Drawings and Change Orders
- f) Contractor's Proposal and Bid Schedule
- g) Detailed Specifications
- h) Technical Specifications
- i) Instructions to Bidders
- j) Notice to Bidders

8. This agreement shall be binding upon the personal representatives, successors and assigns of the parties hereto.

In the WITNESS WHEREOF, the parties hereto have executed this document the day and year first above written.

WITNESS:

CITY OF MT. PLEASANT

\_\_\_\_\_

By: \_\_\_\_\_  
Bruce Kilmer, Mayor

\_\_\_\_\_

\_\_\_\_\_

WITNESSES:

\_\_\_\_\_  
Contractor

\_\_\_\_\_

By: \_\_\_\_\_  
Signature-authorized officer

\_\_\_\_\_

\_\_\_\_\_  
Print or Type Name & Title

[Form44]

City of Mt. Pleasant, Michigan

## **PAYMENT BOND**

(Under Act 213 of 1963)

KNOW ALL MEN BY THESE PRESENTS, That \_\_\_\_\_, as PRINCIPAL, and \_\_\_\_\_, a Corporation, organized and existing under the laws of the State of Michigan, and duly authorized to transact business in the State of Michigan, as SURETY, are held and firmly bound unto THE CITY OF MT. PLEASANT, MICHIGAN, as obligee, and hereinafter called "OWNER", in the just and full sum of \_\_\_\_\_ Dollars and \_\_\_\_\_/100 (\$\_\_\_\_\_) lawful money of the United States of America, for the payment whereof, the PRINCIPAL and SURETY bind themselves, their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above PRINCIPAL has entered into a written contract with the OWNER, dated \_\_\_\_\_, 2011, for the work known as:

### **2011 Reservoir Roof Replacement**

in accordance with the plans and specifications prepared by THE CITY OF MT. PLEASANT, DIVISION OF PUBLIC WORKS, Mt. Pleasant, Michigan, which contract is hereby referred to and made a part hereof as fully and to the same extent as if the same were entirely written herein; and

WHEREAS, this bond is given in compliance with and subject to the provisions of the Act 213 of the Public Acts of Michigan for the year 1963, as amended by subsequent acts to date.

NOW, THEREFORE, the conditions of this obligation are that if the PRINCIPAL and its subcontractors shall make all payments as they become due and payable of all amounts owing to subcontractors and to parties supplying labor or materials to the PRINCIPAL, or to its subcontractors, in the prosecution of the work provided for in said contract (intending to include herein all claimants as defined in Section 6 of Act 213 of 1963, as amended), then this obligation shall be void; otherwise, the same shall be in full force and effect; and

PROVIDED, that any alterations which may be made in the terms of the said contract, or in the work to be done under it, or the giving by the party of the first part of

PAYMENT BOND – 2011 Reservoir Roof Replacement

said contract, any extension of the time for the performance of said contract or any other forbearance on the part of either part to the other, shall not in any way release the PRINCIPAL and the SURETY, or either of them, their heirs, executors, administrators, successors, or assigns, from any liability hereunder. Notice to the SURETY of any alterations, extensions of or of any forbearance being hereby waived.

IN WITNESS WHEREOF, signed and sealed this \_\_\_\_ day of \_\_\_\_\_ 2011.

WITNESSES:

\_\_\_\_\_

PRINCIPAL:

\_\_\_\_\_

By: \_\_\_\_\_ (Seal)

\_\_\_\_\_

By: \_\_\_\_\_ (Seal)

SURETY:

\_\_\_\_\_

\_\_\_\_\_

By: \_\_\_\_\_ (Seal)

Title: \_\_\_\_\_

LOCAL ADDRESS OF AGENT FOR SURETY:

\_\_\_\_\_  
(Name)

\_\_\_\_\_  
(Street, City, State, Zip Code)

[Form45]

City of Mt. Pleasant, Michigan

**PERFORMANCE BOND**

KNOW ALL MEN BY THESE PRESENTS, That \_\_\_\_\_, as PRINCIPAL, and \_\_\_\_\_, a Corporation, organized and existing under the laws of the State of Michigan, and duly authorized to transact business in the State of Michigan, as SURETY, are held and firmly bound unto THE CITY OF MT. PLEASANT, MICHIGAN, as obligee, and hereinafter called "OWNER", in the just and full sum of \_\_\_\_\_ Dollars and \_\_\_/100 (\$\_\_\_\_\_) lawful money of the United States of America, for the payment whereof, the PRINCIPAL and SURETY bind themselves, their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above PRINCIPAL has entered into a written contract with the OWNER, dated \_\_\_\_\_ 2011, for the work known as:

**2011 RESERVOIR ROOF REPLACEMENT**

in accordance with the plans and specifications prepared by THE CITY OF MT. PLEASANT, DIVISION OF PUBLIC WORKS, Mt. Pleasant, Michigan, which contract is hereby referred to and made a part hereof as fully and to the same extent as if the same were entirely written herein; and

WHEREAS, this bond is given in compliance with and subject to the provisions of the Act 213 of the Public Acts of Michigan for the year 1963, as amended by subsequent acts to date.

NOW, THEREFORE, the conditions of this obligation are such that if the PRINCIPAL shall, in all respects, well and truly keep and perform the said contract, and shall pay all sums of money due or to become due for any labor, materials, apparatus, fixtures or equipment furnished for the purpose of constructing the work provided in said contract, and shall defend, indemnify and save harmless the OWNER against any and all liens, encumbrances, damages, demands, expenses, costs and charges of every kind, except as otherwise provided in said contract documents, arising out of or in relation to the performance of said work and the provisions of said contract, and shall remove and replace any defects in the workmanship or materials, as provided by contract, then this obligation shall be null and void; otherwise, it shall remain in full force and effect; and

PERFORMANCE BOND – 2011 Reservoir Roof Replacement

PROVIDED, that any alterations which may be made in the terms of the said contract, or in the work to be done under it, or any extension of the time for the performance of said contract or any other forbearance on the part of either part to the other, or the placing of an inspector or resident engineer thereon by the OWNER, shall not in any way release the PRINCIPAL and the SURETY, or either of them, their heirs, executors, administrators, successors, or assigns, from any liability hereunder. Notice to the SURETY of any alterations, extensions of or of any forbearance being hereby waived.

IN WITNESS WHEREOF, signed and sealed this \_\_\_\_\_ day of \_\_\_\_\_ 2011.

WITNESSES:

PRINCIPAL:

\_\_\_\_\_ By: \_\_\_\_\_ (Seal)

\_\_\_\_\_ By: \_\_\_\_\_ (Seal)

SURETY:

\_\_\_\_\_

\_\_\_\_\_ By: \_\_\_\_\_ (Seal)

Title: \_\_\_\_\_

LOCAL ADDRESS OF AGENT FOR SURETY:

\_\_\_\_\_  
(Name)

\_\_\_\_\_  
(Street, City, State, ZIP Code)

City of Mt. Pleasant, Michigan

**ADMINISTRATIVE MEMO NO 8-78**

Issued: October 10, 1978

Revised: June 21, 1989

Subject: **MINIMUM INSURANCE REQUIREMENTS FOR CONTRACTORS**

Summary Statement

The provision of adequate insurance by persons and businesses working for the city or on street right-of-way is essential to protect the public from the costs of injury or damage and to protect the city from unnecessary liability resulting from the acts of persons and businesses working for the city. Minimum insurance requirements are needed to provide this protection.

Memo

Persons or businesses which provide professional services to the city under the terms of a written contract or provide labor and/or material to accomplish work for the city or for others on or over street right-of-way or other city property shall carry insurance and bonds to protect the public and the City from exposure to unnecessary financial risks.

Prior to signing of contracts, issuance of purchase orders or permits, or other authorization to begin work, certificates of insurance evidencing the purchase of insurance in amounts not less than required by the Administrative memo or bid specifications, whichever is greater, shall be filed with City Clerk. Such certificates shall:

- a. Show that the insurance is currently in force and termination date of each policy.
- b. State the limits of liability of the policies covered by the certificate.
- c. Show that the City of Mt. Pleasant is to be specifically named in policy as an "additional insured" and should be issued to the City of Mt. Pleasant as the certificate holder.
- d. Provide that the City will receive not less than 10 days written notice of the cancellation of any listed policy.
- e. Be issued in the name of an insurance company authorized to conduct business in the State of Michigan.

Required bonds shall be filed with the City Clerk prior to the signing of contracts or other authorizations to proceed with work.

Insurance and bonds shall meet or exceed the following requirements. Exceptions to recognize more or less hazardous operations and financial risks should be considered and with approval of the City Manager may be made in specifications or contract requirements prior to awarding contracts or issuing purchase orders.

**INSURANCE REQUIREMENTS**

Type	Limit of Liability	Required of: City Contractor	Contractor On R-O-W
Worker's Compensation and Employer's Liability	Statutory Coverage B \$100,000	X	X
Public Liability (including products and completed operations liability)			
Bodily Injury	\$250,000 each person	X	X
	\$500,000 each accident	X	X
Property Damage	\$250,000 each accident	X	X
	\$250,000 each aggregate	X	X
Automobile Liability (including hired cars and automobile non-ownership)			
Bodily Injury	\$250,000 each person	X	X
	\$500,000 each occurrence	X	X
Property Damage	\$250,000 each accident	X	X
	\$250,000 each aggregate	X	X
Additional Insured Clause	City of Mt. Pleasant to be specifically named in policy as an "additional insured"	X	X
Excess Liability (Required unless risk occurrence is nominal)	\$1,000,000 each	X	

Persons or businesses engaged to provide labor and material in an amount in excess of \$10,000, or who will receive partial payments as work progresses will provide labor, performance and material bonds equal to the value of the work being performed. Such bonds are not required where the work to be done is of a type in which the failure to perform will not adversely affect the city's ability to function or increase the city's cost of completing the work.

[Form43]

City of Mt. Pleasant, Michigan

**NOTICE TO PROCEED**

TO: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

DATE:

PROJECT description: 2011 Reservoir Roof Replacement

You are hereby notified to commence WORK by \_\_\_\_\_, in accordance with the CONTRACT dated \_\_\_\_\_, and you are to complete the WORK by \_\_\_\_\_.

CITY OF MT. PLEASANT, MICHIGAN  
Owner

By: \_\_\_\_\_  
Randy Chesney, Interim Director  
Division of Public Works

**RECEIPT OF NOTICE**

Receipt of the foregoing NOTICE TO PROCEED is hereby acknowledged this day of \_\_\_\_\_.

\_\_\_\_\_  
(Company)

By: \_\_\_\_\_  
(Print or Type Name and Title)

**City of Mt. Pleasant  
2011 Reservoir Roof Replacement**

**SPECIFICATIONS**

**DEFINITIONS:**

The following definitions shall apply in this Specification:

Purchaser - The City of Mt. Pleasant, henceforth known as the City.

Contractor - The party supplying products and services.

**SCOPE OF WORK**

The work to be performed under this contract includes replacement of the 2 Million Gallon (MG) reservoir roof. The roof is a stone covered shingle type roofing overlay covering a plywood decking. The stone and shingle shall be removed, and a white colored vinyl roof system shall be installed. Any rotted or failed plywood shall be replaced. The bids are to include all mobilization, equipment, labor, tools, materials, clean up, and the meeting of all OSHA requirements. All work shall comply with this specification and the attached manufacturer's specification.

**WORK COMPONENTS**

1. Existing Roof Overlay Removal & Surface Preparation
  - A. Remove the existing stone overlay material down to the plywood.
  - B. Replace any plywood that is damaged. There is expected to be very little plywood replacement required. The plywood shall be replaced in a manner that does not introduce wood or debris into the reservoir. The plywood shall be pressure treated wood.
  - C. Clean plywood substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to Duro-Last's written instructions. Remove sharp projections.
  - D. Install 3/8" Duro-Last Duro-Fold roof underlayment.
2. Replacement Roof System
  - A. Provide the vinyl roof correctly sized to cover the reservoir. The system shall be a Duro-Last roofing system; it shall be a white color and capable of all

standard Michigan weather conditions. The reservoir is approximately 120' in diameter. There are two hatches and one vent on the roof. It shall be the Contractor's responsibility to measure the reservoir and supply the correctly sized roof system.

- B. The Duro-Last roofing system shall be installed by an authorized Duro-Last Master contractor. The roof installation shall meet all applicable OSHA standards. The work shall be performed in a manner that keeps the reservoir clean and hazard free.
- C. Flexible Walkways: Install walkway products as indicated;
  - I. Around two hatches. The walkways shall be a minimum of three feet wide. The small hatch is approx 3' x 3', and the large hatch is approx 4' x 6'.
  - II. Install one (1) 6' x 8' work walkway adjacent to the large hatch, and one (1) 6' x 6' work walkway adjacent to the small hatch.
  - III. Install a 3' wide walkway from the east edge of the reservoir approximately 60' to the small hatch.
  - IV. Install a 3' walkway around the center vent.
- D. Mechanically fasten roofing material securely at terminations, penetrations, and perimeter per Duro-Last's specifications.
- E. All auxiliary materials shall be supplied by the Duro-Last manufacturer or approved by the manufacturer.
- F. The bid shall include prices for both a 40 mil system and a 50 mil system.

### 3. Inspection and Warranty

- A. Inspection: Arrange for Duro-Last's technical representative to inspect roofing installation on completion. Any deficiencies identified during the inspection shall be corrected and made ready for re-inspection within five working days. Such corrections shall be made at no expense to the city.
- B. Contractor Warranty: The contractor shall warrant the roof application with respect to workmanship for two (2) years from the date of favorable inspection by the roofing system manufacturer. Should any leaks covered under the warranty occur during this period, corrective action shall be taken by the contractor to repair the roof to the satisfaction of the owner and the roof system manufacturer. All corrective work shall be done at no cost to the City.

- C. Manufacturer Warranty: Must be no-dollar limit type and provide for completion of repairs, total replacement of the roofing system at the then-current material and labor prices throughout the life of the warranty. In addition the warranty shall meet the following criteria:
- I. Warranty period: 15 years from date issued.
  - II. No exclusions for damage caused by ponding water or biological growth, or from incidental or consequential damages.
  - III. Issued direct from and serviced by the Duro-Last Company.
- D. The Contractor shall not take any equipment out of service without the knowledge and approval of the City.

### **Work Schedule**

All work shall be performed during normal business hours unless approved by the City. The project will begin after April 4, 2011 and shall be completed before May 27, 2011.





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# Mechanically Fastened Systems

## SPECIFICATION

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## **SECTION 1 - - - GENERAL**

### **INTRODUCTION**

The following is the information required to install the Duro-Last roofing system. Each installation should be in compliance with the detail drawings, instructions, material descriptions, and other information stated herein.

### **REQUIREMENTS**

1. The Duro-Last roofing system must be installed by an authorized Duro-Last contractor.
2. A Duro-Last Technical Representative must inspect the Duro-Last roofing system for compliance with the Duro-Last specifications before a commercial/industrial warranty is issued. Note: Duro-Last does not perform destructive testing unless visual inspection necessitates a need for further investigation.
3. All materials used in the installation of the Duro-Last roofing system must be products of Duro-Last, Inc. or accepted products as defined and described in the specification. Other materials must be accepted in writing by the Duro-Last Engineering Services department prior to being used in the Duro-Last roofing system.
4. The Duro-Last contractor is responsible for following all applicable building, plumbing, and electrical codes.
5. Buildings 40-feet (12 m) or taller and/or located within high wind zones (greater than 110 mph [177 km/h]) or special wind regions the following applies:
  - a. The Duro-Last Engineering Services Department should be involved in determining the fastening requirements. Typically, the ASCE 7 Specification will be used to determine the fastening requirements. When appropriate, specifications set forth by entities such as FM Global, SPRI or State/Local Agencies will be utilized.
  - b. Fastening tab spacing may not exceed 60-inches (1.5 m) on center unless approved, in writing, by the Duro-Last Engineering Services Department.
6. It is the contractor's responsibility to verify the accuracy of information provided to Duro-Last, including but not limited to pull test results, building height, and roof dimensions. Measurements used during the quotation phase of a project must be checked for accuracy by the installing contractor.

### **TOOLS**

The authorized Duro-Last contractor should have the following tools, which are necessary for the efficient and proper installation of the Duro-Last roofing system.

• Safety Equipment (such as fall protection)	• Equipment necessary to raise materials to the rooftop
• Hand welders (hot-air) with a spare heating element (Optional: Automatic welder)	• Silicone hand roller
• Extension cords - cord length of 100' (30 m), #12/3 wire w/ground	• Ground fault interrupter
• Variable speed power screw driver with reverse	• P-3 screwdriver tips for screws
• Electric hammer drill w/depth gauge	• R-3 square drive tips for concrete screws
• Metal snips, hacksaw, keyhole saw, hammers, scissors, utility knives with retractable blades	• Measuring tapes (100' and 25') (30 and 7.5 m), chalk line, markers, lumber crayon
• 2-inch (50 mm) flat chisels, pry bar	• Vise clamps, nail aprons, caulk gun, screw drivers
• Tack claw	• Ladders
• Tarps	• Gripull
• Core cutter	• Pull tester
• Detergent-based cleaning fluid and rags	• Panduit bander

**MEMBRANE DESCRIPTION**

- A. The Duro-Last membrane is a polyvinylchloride polymer blend, which is reinforced with a high-strength weft-inserted polyester scrim that has a thread pattern of 18 x 14 threads per inch. Refer to the Spec Data Sheets in the “Product Data Sheets” section for a listing of all of the test results and physical properties of the membrane.
1. The 40 mil (1 mm) thick membrane has a system weight of approximately 0.25 lb/ft<sup>2</sup> (1.22 kg/m<sup>2</sup>). The prefabricated roof cover is supplied in sections that are either folded or rolled. Individual sections may be as large as 2,500 ft<sup>2</sup> (232 m<sup>2</sup>), with no single dimension exceeding 100-ft (30 m). Deck sheets can be fabricated up to 3,000 ft<sup>2</sup> (279 m<sup>2</sup>) when using 10-ft (3.05 m) laps, 30'-6" (9.3 m) wide with a full reverse, not to exceed 100-ft (30.5 m) long.
  2. The 50 mil (1.27 mm) thick membrane has a system weight of approximately 0.32 lb/ft<sup>2</sup> (1.56 kg/m<sup>2</sup>). The prefabricated roof cover is supplied in sections that are either folded or rolled. Individual sections may be as large as 2,000 ft<sup>2</sup> (186 m<sup>2</sup>), with no single dimension exceeding 80-ft (24 m). Deck sheets can be fabricated up to 2,500 ft<sup>2</sup> (232 m<sup>2</sup>) when using 10-ft (3.05 m) laps, 30'-6" (9.3 m) wide with a full reverse, not to exceed 80-ft (24.4 m) long.
  3. The 60 mil (1.52 mm) thick membrane has a system weight of approximately 0.39 lb/ft<sup>2</sup> (1.9 kg/m<sup>2</sup>). The prefabricated roof cover is supplied in sections that are either folded or rolled. Individual sections may be as large as 1,500 ft<sup>2</sup> (139 m<sup>2</sup>), with no single dimension exceeding 60-ft (18.28 m).

**APPLICABILITY**

The Duro-Last roofing system consists of the Duro-Last membrane, fasteners, prefabricated corners, parapet flashings, stack flashings, curb flashings, two-way vents, and other related Duro-Last approved products. The Duro-Last roofing system consists of products manufactured by Duro-Last, Inc., or accepted products as defined and described in the specifications. Alternate materials must be pre-approved in writing by the Duro-Last Engineering Services Department prior to their use with the Duro-Last roofing system.

**Drainage/Slope**

Duro-Last warrants its membrane even where ponding water accumulates. Duro-Last has found no adverse effects on its membrane because of a lack of positive drainage, however, good roofing practices incorporate the use of positive drainage for the safety of the structure. The installing contractor is responsible to make sure roof drainage meets local building code requirements.

**WEATHER CONSIDERATIONS**

The Duro-Last membrane is designed to perform in all types of weather. The Duro-Last membrane is regularly subjected to DSET, EMMAQUA Exposure and low temperature cracking (ASTM D-2136) testing. Installation of the Duro-Last membrane is limited only by the exposure limitations of the installers. It is Duro-Last's recommendation that installation be performed within the temperature range of -15 to 115 °F (-26 to 46 °C).

**DELIVERY**

The Duro-Last roofing system and related materials will be delivered to the location designated by the Duro-Last contractor in the original packaging and with shipping labels intact. Containers will be labeled with manufacturers/supplier's name, product name, and identification. Each shipment should be checked for damages and/or shortages at the time of delivery. The freight agent must note damaged materials and/or shortages on the freight bill. Concealed damage must be reported to the freight agent immediately. Materials damaged in shipping, handling, or storage cannot be used.

**HANDLING**

Once the Duro-Last roofing system is delivered, the contractor and contractor's crew are responsible for all handling and installation of the roofing system. Adequate personnel and equipment should be available to safely lift and place the Duro-Last roofing system onto the rooftop. Folded or rolled prefabricated sections of membrane must be placed on the roof near load-bearing members, and in a manner convenient to final placement.

**STORAGE**

Duro-Last materials should be kept clean and dry. Materials should be stored on pallets and covered with tarps. Care should be taken to place materials away from areas where water may pond or areas that water falls onto from higher elevations. All sealants must be stored at temperatures above 40 °F (5 °C). Keep combustible materials away from heat, sparks, and open flames. Follow precautions outlined on the containers or supplied by the material manufacturer.

**SUBSTRATE SEPARATION**

The Duro-Last membrane is defect-free when it leaves the factory. Certain substrates are not compatible with the Duro-Last membrane and may cause premature failure of the membrane. Over the substrates listed below, install a minimum 3 mil polyethylene or polypropylene slip sheet prior to the installation of the Duro-Last membrane.

Acrylic Coatings	Extruded Polystyrene	Modified Bitumen	Shingles
Aluminum Coated Asphalt	Granulated Cap Sheet	Old Duro-Last Roofs	TPO (Thermoplastic Polyolefin)
Coated or Smooth Asphalt	Hypalon (CSPE)	Polyurethane	Sprayed Urethane Foam
Expanded Polystyrene	Mineral Surfaced Cap	Coal Tar Pitch	PVC/CPA Membranes

The Duro-Last membrane is compatible with the following substrates, and no separation is required.

CPE Roofing	GP DensDeck™ and DensDeck™ Primed	Glass Fiber Board
Cellular Glass Boards	Polyisocyanurate Insulation Boards	
EPDM (clean)	Lightweight\Structural Concrete Decks (Smooth)	Wood Decks
Gypsum	Smooth Pre-stressed Concrete Decks	

**CHEMICAL RESISTANCE**

Duro-Last membrane is resistant to the chemicals listed below. If any other chemicals are present on a particular roof, please contact the Engineering Services Department.

Acrylic Paint	Linseed Oil	Copper Sulfate	Lard (Animal Fats)
Latex Paint	Masonry Cleaner	Ferric Chloride	Phosphoric Acid
Fertilizer Solution	Muriatic Acid	Fiberglass Mat	Polypropylene
Fruit Juice	Oleic Acid	Furnace Residue	Zinc Chloride
Hydrogen Peroxide	Sodium Hydroxide	Detergent Solution	Bleach

**PAINT APPLICATION**

The Duro-Last membrane may be painted, although vinyl edging may not be painted. See the Chemical Resistance section for approved paint types for the membrane. If the vinyl edging is painted and causes damage to the edgings, Duro-Last Roofing, Inc. will not be held responsible for repair or replacement under the warranty. Should you have any questions, please contact the Duro-Last Quality Assurance Department.

## SECTION 2 - - - QUALITY ASSURANCE

### **PRE-JOB INSPECTION**

When recovering an existing roofing system, the authorized Duro-Last contractor is responsible to conduct an inspection of the proposed job site roof conditions to determine the needed fastener type and length, evaluate the moisture content of the existing roofing system, and to note damaged areas to be repaired prior to installation of the Duro-Last roofing system.

### **CORE CUTS**

1. The Duro-Last contractor is responsible for performing a series of core cuts to determine and verify the above information. The Duro-Last contractor and/or building owner is responsible for the repair of all core cuts.
2. Duro-Last, Inc. does not approve the practice of roofing over existing roofing systems that contain excess moisture. Excess moisture is defined as water observed within a core cut or water squeezed from the core sample taken.
3. Duro-Last’s post-installation warranty inspection does not check the moisture content of the substrate.

### **PULLOUT TESTS**

1. Fastener pullout tests must be conducted on the roof deck with approved fasteners to verify the integrity of the deck and to establish fastening patterns that meet the requirements of Duro-Last specifications. Contact the Duro-Last Engineering Services Department with any questions.
2. It is the responsibility of the Duro-Last contractor to make sure pullout tests are performed on site. The tests can be performed by either the fastener manufacturer or the authorized Duro-Last contractor. The sections of decking where integrity is in question should be the locations for the tests. The pullout tests must be documented on a roof drawing showing the location and pullout value of each test. In situations where new construction prevents on-site pullout tests, a pre-assembled deck representing the proposed deck type should be constructed and tested.
3. The number of pullout tests required will be as follows: perform a minimum of 10 tests for up to 50,000 ft<sup>2</sup> (4,645 m<sup>2</sup>) and five additional pull tests for each additional 50,000 ft<sup>2</sup> or portion thereof, on each project. Areas of low pullout results will require additional pullout tests.
4. It is the responsibility of the Duro-Last contractor to verify pullout values prior to installation.

### **FASTENER SELECTION AND DECK TYPES**

The fasteners used to attach insulation, recover board and Duro-Last membrane must be supplied by Duro-Last, Inc. The following tables summarize the appropriate fasteners to use for different deck types and system components. If a fastener type is needed that is not listed below, the Duro-Last Engineering Services Department must approve its use, in writing, prior to installation.

#### **Plate Selection**

When determining which plates to use and where to use them, refer to this table.

	2-inch (50 mm) Poly-Plate	2.4-inch (61 mm) Cleat Metal Plate	3-inch (76 mm) Square Metal Plate	Insulation Plate
Membrane Fastening				
Fastening Tabs	Yes	Yes	No*	No
Parapet Flashings	Yes	Yes	Yes	No
Base of Walls/Penetrations	Yes	Yes	Yes	No
Insulation Boards	Yes	Yes	Yes	Yes
Cover Boards	Yes	Yes	Yes	No

\* Allowed by deviation only or on the Duro-Roof system.

**Fastener Selection Based on Deck Type**

When determining which fastener type to use for a specific deck type, refer to this table. Note that pullout tests must be performed on each deck and that fastener spacing must be determined based on the “Fastener Spacing Tables” on the following page. If the minimum pullout values required cannot be achieved contact the Duro-Last Engineering Services Department for assistance.

Deck Type	Fastener Type	Notes
<b>Steel</b>	Duro-Last HD Screws Duro-Last XHD Screws	Must penetrate a minimum of 1-inch (25 mm) from the top surface of deck.
<b>Wood</b>	Duro-Last HD Screws Duro-Last XHD Screws	Must penetrate a minimum of 1-inch (25 mm) from the top surface of deck.
<b>Structural Concrete</b>	Duro-Last Concrete Nail Duro-Last Concrete Screw Duro-Last HD Screws Duro-Last XHD Screws	Must penetrate a minimum of 1-inch (25 mm) from the top surface of deck. Pre-drill a minimum of 1/2-inch (12.7 mm) deeper than the required depth of the fasteners using a 3/16-inch (5 mm) bit.
<b>Gypsum</b>	Auger Fastener* Liquid Auger Fastener**	Minimum pullout requirements must be met. See “Fastener Spacing Tables”, page 7.
		Pre-drill required for auger fasteners. Use a 7/16–9/16-inch (11 – 14mm) bit.
		* Must penetrate a minimum of 1-1/2-inch (38 mm) from the top surface of deck. * Factory Mutual designed systems require minimum of 2-inch (50 mm) penetration.
		** Liquid Augers must penetrate a minimum of 2-inch (50 mm) from the top surface of the deck.
<b>Cementitious Wood Fiber (Tectum)</b>	Auger Fastener* Liquid Auger Fastener**	Minimum pullout requirements must be met. See “Fastener Spacing Tables”, page 7.
		<b>Do not pre-drill.</b>
		* Must penetrate a minimum of 1 1/2-inch (38 mm) from the top surface of deck. * Factory Mutual designed systems require minimum of 2-inch (50 mm) penetration.
		** Liquid Auger must penetrate a minimum of 2-inch (50 mm) beyond the top surface of the deck.
<b>Lightweight Concrete</b>	Auger Fastener* Liquid Auger Fastener** Duro-Last Concrete Screw Duro-Last Concrete Nail Duro-Last HD Screws Duro-Last XHD Screws	Minimum pullout requirements must be met. See “Fastener Spacing Tables”, page 7.
		Pre-drill required. Augers: Use a 7/16–9/16-inch (11 – 14 mm) bit. Others: Use a 3/16-inch (5 mm) bit.
		* Must penetrate a minimum of 1-1/2-inch (38 mm) from the top surface of deck. * Factory Mutual designed systems require minimum of 2-inch (50 mm) penetration.
		** Liquid Auger must penetrate a minimum of 2-inch (50 mm) from the top surface of the deck.
<b>Walls and Curbs</b>		Notes
<b>Cinder and Concrete Block</b>	Zinc Plated Metal Anchors Duro-Last Concrete Screw Duro-Last Concrete Nail Duro-Last HD Screws Duro-Last XHD Screws	Must penetrate a minimum of 1-inch (25 mm) from the top surface. Pre-drill a minimum of 1/2-inch (12.7 mm) deeper than the required depth of the fasteners using a 3/16-inch (5 mm) bit (1/2-inch (12.7 mm) for metal anchors).

**FASTENER SPACING TABLES\* – FOR USE WITH ALL DECK TYPES**

60 psf System Design Table (Field Area Only)	Fastener Pullout Resistance		Fastener Spacing Along Laps					
			120-inch Lap Spacing		60-inch Lap Spacing		28-inch Lap Spacing	
	lb.	N	in.	mm	in.	mm	in.	mm
	450	2000	9	230	18	457	24	610
	375	1670	6	230	15	380	18	455
	350	1550	6	150	15	380	18	455
	325	1445	6	150	12	305	18	455
	300	1330	6	150	12	305	18	455
	275	1220	N.A.		12	305	18	455
	225	1000	N.A.		9	230	18	455
	210	930	N.A.		6	150	18	455
	175	780	N.A.		6	150	15	380
	150	665	N.A.		6	150	15	380
	140	620	N.A.		N.A.		12	305
	Less than 140 (620)		N.A.		N.A.		N.A.	

90 psf System Design Table (Field Area Only)	Fastener Pullout Resistance		Fastener Spacing Along Laps					
			120-inch Lap Spacing		60-inch Lap Spacing		28-inch Lap Spacing	
	lb.	N	in.	mm	in.	mm	in.	mm
	450	2000	6	230	12	305	18	455
	375	1670	N.A.		9	230	18	455
	350	1550	N.A.		6	150	18	455
	325	1445	N.A.		6	150	18	455
	300	1330	N.A.		6	150	15	380
	275	1220	N.A.		6	150	15	380
	225	1000	N.A.		6	150	18	455
	210	930	N.A.		N.A.		12	305
	175	780	N.A.		N.A.		9	230
	Less than 175 (780)		N.A.		N.A.		N.A.	

Pullout values greater than 450 lbs can only be used with the Duro-Roof system.

1. For buildings 40-feet (12 m) or taller and/or located within high wind zones (greater than 110 mph [177 km/h]) or special wind regions;
  - a. The Duro-Last Engineering Services department should be involved in determining the fastening requirements. The ASCE 7 Specification will be used to determine the fastening requirements. When appropriate, specifications set forth by entities such as FM Global, SPRI or State / Local Agencies will be utilized.
  - b. Fastening tab spacing may not exceed 60 in. (1.5 m) on center unless approved, in writing, by the Duro-Last Engineering Services department.

The tables to the left indicate the membrane fastening within the FIELD AREA only. Membrane attachment on Duro-Last designed roof systems, buildings in special wind regions or those 40-feet or taller, and all Factory Mutual-insured buildings will require special field, perimeter, and corner fastening.

The width of the perimeter area is determined by the either the lesser of 40% of the building height at the eaves or 10% of the overall plan width of the building and/or roof area. The perimeter must never be less than five-feet wide.

Contact the Duro-Last Engineering Services department for additional information.

## SECTION 3 - - - IMPLEMENTATION

**ROOF PREPARATION****RECOVER – Built-up Roofs (BUR)**

- a. If the BUR is gravel surfaced and the pea gravel or crushed stone is 1/4 - 3/8-inch (6 - 10 mm) in size, it must be leveled and maintained at 4 lb./ft<sup>2</sup> (20 kg/m<sup>2</sup>). A minimum 3/8-inch (10 mm) fan fold board, supplied by Duro-Last, approved recover board, or 1-inch (25 mm) thick insulation must be used to overlay the gravel.
- b. If the loose stone on an old BUR is vacuumed or swept, A minimum 3/8-inch (10 mm) fan fold board, supplied by Duro-Last, approved recover board, or 1-inch (25 mm) thick insulation must be used to overlay the existing system. CAUTION: Removing more than the loose gravel may affect the fire rating. Contact the Duro-Last Engineering Services Department for assistance regarding fire rated assemblies.
- c. If the BUR is a smooth or granular surfaced application, and is free of sharp edges and debris, it can be recovered with a minimum of a 3 mil polyethylene slip sheet, though Duro-Last fan fold board is recommended.
- d. EPS insulation cannot be used over coal tar pitch or asphalt without a slip sheet between the coal tar pitch and the insulation as well as between the membrane and the insulation. Duro-Last underlayments are approved for direct application over aged coal tar pitch roofs.
- e. When roofing over asphalt or coal tar roofs (including tear-off), an approved separator sheet must be used. Asphalt-based products are incompatible with the Duro-Last roofing membrane. Note: Should the Duro-Last membrane become soiled with roofing asphalt, the affected membrane must be cleaned immediately using approved cleaners and procedures. If the asphalt cannot be properly cleaned from the membrane, the affected membrane must be removed and new membrane installed, or overlay the affected area with an approved slip sheet and new membrane. Extreme caution should be taken if you are doing a tear-off while installing the membrane.

**RECOVER – Single-Ply Roofs**

- a. The existing single-ply roofing membrane must be cut free from the entire roof perimeter, cut free around all penetrations, and cut in between fastener rows prior to the installation of the Duro-Last membrane. When reroofing after a tear-off, caution should be used to prevent the Duro-Last membrane from contacting incompatible materials. (See "Substrate Separation", page 4)
- b. If the existing system is mechanically fastened, there is often a problem with loose fasteners. Because of this problem, cut the membrane open and remove all loose fasteners before installing the slip sheet.
- c. If a PVC membrane has been installed directly over styrene insulation without a separation sheet, then the old membrane must be removed, damaged insulation replaced, and an approved slip sheet installed.
- d. If the existing membrane is ballasted and the Duro-Last membrane is to be mechanically fastened, it is necessary to do fastener pullout tests on the deck. Also, the type of insulation and its density needs to be determined to ensure that the insulation will meet the Duro-Last specification. (See "Substrate Separation", page 4). Be aware that if the existing insulation is "loose-laid" it must be fastened with an approved fastening pattern (See Detail 1020).

**RECOVER – Metal Roof Recover/Retrofit**

- a. The metal roof panel must be clean, smooth, and free of sharp edges and loose foreign material. Damaged areas and other factors affecting the installation of the Duro-Last roofing system must be repaired prior to the installation of the membrane.
- b. A metal roof panel must be separated from the Duro-Last membrane by using a recover board of at least 7/16-inch thick (11 mm) hardboard (gypsum), plywood, or oriented strand board (OSB) or 1-inch (25 mm) rigid insulation. When 1-inch rigid insulation is used, flute filler must be used and must consist of polyisocyanurate insulation. Note: According to International Building Code (IBC), the use of above-deck

thermal insulation (including extruded or expanded EPS) is covered with an approved roof covering and passes the tests of FM 4450 or UL 1256 when tested as an assembly. The gaps between the ribs of the metal and the insulation fill cannot exceed the recover board manufacturer's recommendation for spanability. Flute filler must be fastened as needed to hold the flute fill in place. (Note: Duro-Last fanfold may be used if the flutes are filled with no gaps exceeding 1/4-inch total in between metal ribs.)

- c. Insulation/recover board must be neatly fitted to the roof deck and its penetrations. Four by eight -feet (1.2 x 2.4 m) boards must be attached with a minimum of five fasteners/distribution plates. See details 1020 & 1030 found in the detail section of this manual for mechanical attachment of additional sizes of recovery boards. Gaps between insulation/recovery boards cannot exceed 1/4-inch (6 mm) in width. No more insulation/recovery board will be installed than can be covered with membrane and completed before the end of the day's work or before the onset of inclement weather. Duro-Last fasteners and plates as well as approved fastening patterns are required for attachment of all insulation/recover board. Contact the Duro-Last Engineering Services Department with any questions.
- d. High-density wood fiberboard is acceptable on metal building recovers when the building slope is at least 1-inch (25 mm) vertical for every 12-inches (305 mm) horizontal. High-density wood fiber will not be accepted as flute filler.
- e. Plywood is acceptable to recover metal roofs. The minimum thickness, if it is being used as recover board, shall be 7/16-inch (11 mm). Fasteners must penetrate through both the plywood and the existing metal roof.
- f. If plywood will be acting as the new substrate for membrane attachment, the plywood must be a minimum of 9/16-inch (14 mm) thick and a pull-test must be conducted on the new lumber to determine the proper lap spacing and attachment along the tab. Contact the local building authority to determine compliance of deck attachment to the building structure. Note: It is the responsibility of the contractor to ensure that the weight requirements of the building are not exceeded when installing additional materials over pre-engineered buildings.

## NEW CONSTRUCTION

- a. All concrete surfaces must be troweled smooth. If the concrete surface is not smooth, a minimum 3/8-inch (10 mm) fan fold board, supplied by Duro-Last, is required.
- b. The roof deck or existing roof system must be clean, smooth, free of sharp edges, and loose foreign material. Damaged areas and other factors affecting the installation of the Duro-Last roofing system must be repaired prior to the installation of the membrane.
- c. A metal deck must be separated from the Duro-Last membrane by at least 7/16-inch (11 mm) hardboard (gypsum, plywood, or oriented strand board) or 1-inch (25 mm) rigid insulation. It is the responsibility of the contractor to ensure that the selected insulation is adequate to span the flutes of the deck. If it is not, the flutes must be filled with an approved insulation. See "Insulation Selection and Installation" for further details.
- d. All plywood surfaces must be smooth and free of all foreign material. Gaps between sheets of plywood should not exceed 1/4-inch (6 mm). Prior to the installation of the membrane a slip sheet such as geotextile, 3-mil polyethylene film or duct tape must be installed over any H-clips if they are used on any plywood decking.

## INSTALLATION

### WOOD NAILER

Wood nailers must be a #2 grade lumber, or better and must be fastened to the deck, wall or existing secured nailer in such a manner that they resist 180 lb. of force per linear foot (2,643 N/M) of nailer in any direction. Fasteners used to attach wood nailers must be spaced no greater than 18-inches (455 mm) apart. Wood nailers are required in any situation where 1-inch (25 mm) or greater of insulation is added to the roof perimeter edge. The top of the nailers must be flush with the top of the insulation. Wood nailers are not required at a change of plane such as the intersection between a parapet wall and the decking.

Duro-Last Engineering Services requires that for nailers and other lumber supports identified as ACQ or CA treated, only stainless steel fasteners be used. Additionally, for all new construction, untreated lumber should be used for nailers with standard e-coated fasteners. Further, treated lumber dating 2003 or earlier is acceptable for use with e-coated fasteners as lumber prior to 2003 of age is unlikely to contain the copper based treatments.

**INSULATION SELECTION AND INSTALLATION**

Insulation products must be neatly fitted to the roof deck and its penetrations. 4 x 8-foot (1.2 x 2.4 m) insulation boards must have a minimum of five fasteners/distribution plates installed per board. No gap should exceed 1/4-inch (6 mm) in width. No more insulation products should be installed than can be covered with membrane and completed before the end of the day’s work or before the onset of inclement weather. Duro-Last fasteners and Duro-Last plates as well as approved fastening patterns are required for attachment of all insulation products.

The minimum compression characteristics of insulation products as determined by ASTM D-1621 will be as follows:

- Polyisocyanurate products: 20 psi (137.8 kPa)
- Fiberglass products: 16 psi (110.3 kPa)
- Extruded polystyrene products: 25 psi (172.3 kPa)
- Expanded polystyrene products: 15 psi (124.1 kPa) and 1.5 pcf (24 kg/m<sup>3</sup>) density (certified) and a minimum 1-inch (25 mm) thick.
- Expanded polystyrene products covered with or laminated to a hardboard facer: 12 psi (82.7 kPa) and 1.25 pcf (20 kg/m<sup>3</sup>) densities and a minimum of 1-inch (25 mm) thick.

**PERIMETER MEMBRANE INSTALLATION**

- a. The first fastening tab on all perimeter roof sections that have tabs parallel with the roof edge or parapet wall, must be between 24 - 36 inches (610 - 915 mm) from the edge or the wall. If the parapet wall is greater than 24-inches (610 mm) tall, the perimeter tab may be placed up to 63-inches (1.6 m) away from the roof edge when utilizing roof sections with maximum lap spacing of 60-inches (1.5 m) on center.
- b. When using roof sections with fastening tabs spaced 120-inches (3 m), the first tab along all perimeter roof edges must be located 24 - 36-inches (610 – 915 mm) from the edge. The second tab must be placed 84 - 96-inches (2130 – 2440 mm) from the edge. Parapet wall height does not change this requirement.
- c. On buildings with multiple roof levels, treat all roof edges as perimeter edges if they stand 3-feet (915 mm) or more above adjacent or surrounding roof areas.
- d. On buildings located in high wind zones (greater than 110 mph [177 km/h]) or on structures that are 40-feet (12 m) or taller, additional wind tabs and/or increased fastener density may be required. Contact the Duro-Last Engineering Services department for assistance.

**MEMBRANE INSTALLATION**

- a. The prefabricated roof section is unrolled and positioned on the deck to expose the first securement tab. The securement tab is mechanically fastened to the deck with approved fasteners and stress distribution plates (see “Fastener Selection and Deck Types”, page 6). The roof section is then unfolded and pulled taut to remove any wrinkles exposing the second securement tab. This process is repeated until the entire roof section has been mechanically fastened to the deck, including all securement tabs and edges. The next section of roofing membrane is then positioned to provide a minimum 6-inches (152 mm) overlap. The above procedure is repeated for each roof section.
- b. The edge of the stress distribution plate must be installed flush with the outside edge of a fastening tab.
- c. The maximum fastener spacing is 18-inches (457 mm) on center in rows 60-inches (1.5 m) apart. For tab spacing greater than 60-inches (1.5 m), the maximum fastener spacing is 12-inches (305 mm) on center. (Refer to the Fastener Spacing Table, page 7.)

- d. When installing membrane, ensure that the appropriate side of the membrane is exposed to elements. For white and gray membrane, the smooth side should be exposed. On the tan membrane, it will be the embossed side of the membrane that should be exposed.
- e. If the membrane is attached to the support structure beneath the roof deck, special precautions must be taken. If the membrane is attached to a steel purlin structure, all fasteners must penetrate a minimum of 1-3/4-inch (44 mm) from the top of the purlin using Duro-Last purlin fasteners. If the membrane is being attached to a wood truss structure, all fasteners must penetrate a minimum of 1-inch (25 mm) from the top surface of the truss with approved Duro-Last fasteners.

### **HOT-AIR WELDING**

- a. Position the membrane so that the top membrane overlaps the bottom membrane a minimum of 6-inches (152 mm). Ensure the welding area is dry, clean and free of foreign material.
- b. Weld the top membrane to the bottom membrane using a hand-held welder or an automatic welding machine, and silicone roller. A minimum 1-1/2-inch (38 mm) wide continuous weld is required.
- c. All field-welded seams must be inspected with a tack claw or similar tool (cotter key extractor), and all deficiencies repaired prior to inspection by Duro-Last.

### **FLASHINGS**

- a. The Duro-Last membrane must not contact surfaces which maintain or exceed temperatures of 120 °F including all insulated chimney pipes, exhaust pipes, and combustible fuel pipes.
- b. All flashings must be terminated at a minimum of 8-inches (203 mm) above the roof surface.
- c. See “Mechanically Fastened” details section for installation references.

### **TWO WAY AIR VENT**

- a. Install Duro-Last Two-Way Air Vents following these guidelines:
  1. Install at a rate of one vent for every 1,000 ft<sup>2</sup> of deck area.
  2. Do not install the vents near drains or in valleys.
  3. Evenly space the vents across the roof area and center them between fastening tabs.
- b. It is the contractor's responsibility to ensure that adequate secondary drainage exists to prevent flooding during extreme weather when water could infiltrate the two-way vent.
- c. See Details 5020 for installation references.

### **ROOF DRAINS AND SCUPPERS**

- a. Drain Assemblies with Clamping Rings
  1. All existing roofing materials must be removed from drain bowl and clamping ring.
  2. Use Duro-Caulk Plus between the membrane and clamping ring (1/2 tube minimum).
  3. After the Duro-Last membrane is properly installed onto the bowl and the clamping ring set in place, all bolts securing the ring must be installed to provide constant, even compression on the sealant. If bolts are broken or missing, replacements must be installed.

- b. Duro-Last Drain Boots
  - 1. If the Duro-Last drain boot is to be used, apply one-half (1/2) tube of sealant minimum to the outside of the drain boot and insert it into the drain.
  - 2. Install composite compression drain rings as low into the drain as possible.
- c. See Details 2011, 2020, 2021, 2025, 2030, 2041, 2050, 2060, 2061, 2070 and 2071 for installation references.

### EXPANSION JOINTS

- a. See Details 1140, 1150, 1160, 1170 and 6160 for installation references.

### PITCH PAN

- a. Use pitch pans only when standard Duro-Last flashings cannot be used.
- b. Only Duro-Last Duro-Caulk Plus or approved sealer may be used when creating a pitch pan.
- c. See Details 4030, 4040 and 4045 for installation references.

### WALKWAY PAD

- a. Duro-Last Roof Trak® III Walkway Pad is recommended at all roof access points, service units and high traffic areas. The risk of potential third party damage to the Duro-Last roofing system may increase should the building owner choose not to utilize the Duro-Last Roof Trak III Walkway Pad. Note: Prior to inspection of the installation by Duro-Last, attach only one side of any Walkway Pads that will be covering any field seams. This will allow the Duro-Last Technical Representative to inspect the entire field seam. After the inspection, hot-air weld the remaining side to complete the attachment of the pad.

### CAUTIONS AND WARNINGS

1. Duro-Last Roofing, Inc. is not responsible for damage that may occur as a result of moisture created from condensation occurring within or beneath a roof deck subassembly or building.
2. All Polystyrene insulation (Styrofoam, Formular, Dow, EPS, etc. - blue, white, gray, green, or pink) must have an approved non-styrene facer or a 3 mil polyethylene slip sheet covering when installed in direct contact with existing or new PVC membranes. Polyethylene or polypropylene facers are acceptable only after testing, and approval by Duro-Last for compatibility.
3. Phenolic foam is not an approved insulation in new construction or re-roofing applications. The Duro-Last roofing system may not, under any circumstance, be installed over phenolic foam.
4. Perlite and wood/mineral fiber-boards are not acceptable substrates for the Duro-Last membrane. (See #5 below for exception on wood fiber board)
5. High density wood fiber boards are only acceptable on a metal roof that is being retrofitted where the slope of the roof will be 1-inch (25.4 mm) per 12-inch (305 mm) slope or greater.
6. If asbestos is encountered, the building owner must be notified at once. The owner is solely responsible for determining the proper course of action.
7. A Duro-Last roof shall not be installed over areas of roofs if one or more of the following conditions exist:
  - a. The building structure is not sufficient to handle the load of the completed system.
  - b. It is not possible to find an approved fastener that will properly hold in the substrate.
  - c. Roofs are subject to hot embers, slag, or burning debris.
  - d. Incompatible chemicals exhausted directly onto the roof or may come in contact with the roof in liquid form. (See "Chemical Resistance", page 4)
  - e. Steam is exhausted directly onto the roof that is in excess of 120° F (49° C).