

IFB # 26-53

SOLICITATION FOR: On-Call Repairs to Irrigation and Water Features



CITY OF SOMERVILLE, MASSACHUSETTS
Jake Wilson, Mayor

Procurement and Contracting Services Department
Angela M. Allen, Chief Procurement Officer

RELEASE DATE: 3/4/2026

QUESTIONS DUE: 3/12/2026 by 2PM EST

DUE DATE AND TIME: 3/18/2026 by 3PM EST

MANDATORY PRE-BID MEETING DATE AND TIME: 3/11/2026 at 1:00 PM EST

MANDATORY PRE-BID MEETING LOCATION: 81 Highland Avenue, Somerville MA 02143

DELIVER TO:
City of Somerville
Procurement & Contracting Services

Attn: Felisa Gárate
Senior Procurement Manager
fgarate@somervillema.gov
93 Highland Avenue
Somerville, MA 02143

IFB # 26-53**On-Call Repairs to Irrigation and Water Features****Key Project Information**

Project Address	Various locations throughout the City of Somerville, MA
Estimated Construction Cost	\$90,000 for 3 years (\$30,000 annually)
Anticipated Contract Award	3/25/2026
Est. Contract Commencement Date	4/15/2026
Est. Contract Completion Date	12/31/2026 With two (2) additional one (1) year renewals at the City's sole discretion. If renewed for a second year, the start date will be 1/1/2027.
Governing Bid Law	MGL 30.39M (Horizontal Construction)
Wage Requirements	State Prevailing Wages
Payment Bond Requirements	50% of Contract Value
Performance Bond Requirements	N/A
Liquidated Damages (\$ per Day)	N/A

Managing Department Information

Managing City Department	DPW
Project Manager	Ben Waldrup
Project Manager Email	bwaldrup@somervillema.gov

TABLE OF CONTENTS

• PART 1: INVITATION FOR BID DOCUMENTS

Section 1: GENERAL INFORMATION ON BID PROCESS

1.1	General Instructions
1.2	Bid Schedule
1.3	Submission Instructions
1.4	Questions
1.5	General Terms

Section 2: RULE FOR AWARD, QUALITY REQUIREMENTS, AND PROJECT BACKGROUND

2.1	Rule For Award
2.2	Project Background
2.3	Minimum Quality Requirements

Section 3: BID PRICING

3.0	Form for General Bid
	Unit Price Form (if applicable)

Section 4: REQUIRED BID FORMS / BIDDERS' CHECKLIST

4.1 <i>(required with bid)</i>	Signed Cover Letter
	Somerville Living Wage Form
	Quality Requirements Form (Section 2.0)
	Certificate of Non-Collusion & Tax Compliance
	Certificate of Signature Authority
	Reference Form (or equivalent may be attached)
	5% Bid Deposit
	Prevailing / Davis Bacon Wages, Statement of Compliance Form
	OSHA Form
	Vulnerable Road Users Ordinance
	Somerville Wage Theft Ordinance
	Acknowledgement of Addenda (if applicable)
	Signed W9
4.2 <i>(required post bid)</i>	Certificate of Good Standing (will be required of awarded Vendor; please furnish with bid if available)
	Insurance Specifications (will be required of awarded Vendor; furnish sample certificate with bid, if possible)
	Statement of Management (if applicable)
	Payment Bond (50% of Contract Value)

• PART 2: SAMPLE CONSTRUCTION CONTRACT / CITY'S GENERAL TERMS AND CONDITIONS

• PART 3: TECHNICAL SPECIFICATIONS

Part 1: Invitation for Bid Documents

IFB # 26-53
On-Call Repairs to Irrigation and Water Features

1.1 General Instructions

This solicitation will be publicly available on the Procurement & Contracting Services (PCS) Department webpage <https://www.somervillema.gov/procurement> on and after 3/4/2026 . Interested parties can also contact the PCS department during the below-noted City Hall hours of operation.

City Hall Hours of Operation:	
Monday – Wednesday	8:30 a.m. to 4:30 p.m.
Thursday	8:30 a.m. to 7:30 p.m.
Friday	8:30 a.m. to 12:30 p.m.

All Responses Must be Sealed and Delivered To:

Procurement & Contracting Services Department
City of Somerville
93 Highland Avenue
Somerville, MA 02143

It is the sole responsibility of the Offeror to ensure that the bid arrives on time at the designated place. Late bids will not be considered and will be rejected and returned.

Bid Format:

Submit one, original (1) sealed bid package; it must be marked with the solicitation title and number. Online submission procedures are described below in Section 1.3.

BIDS SUBMITTED MUST BE AN ORIGINAL.

The completion of the following forms is necessary for consideration of a potential contract award. submitting bid documents, please retain the order of documents as provided below:

- 1) Form for General Bid
- 2) Unit Price Form (if applicable)
- 3) Somerville Living Wage Form
- 4) Quality Requirements Form
- 5) Certificate of Non-Collusion & Tax Compliance
- 6) Certificate of Signature Authority
- 7) Reference Form
- 8) 5% Bid Deposit
- 9) Prevailing / Davis Bacon Wages Statement of Compliance Form
- 10) OSHA Form
- 11) Somerville Vulnerable Road Users Ordinance Form
- 12) Somerville Wage Theft Ordinance

If all required documents are not present, the bid may be deemed non-responsive and may result in disqualification of the bid unless the City determines that such failure(s) constitute(s) a minor informality, as defined in Chapter MGL 30B.

A complete bid must also include a cover letter signed by an official authorized to bind the Offeror contractually and contain a statement that the proposal is firm for ninety (90) days. **An unsigned letter, or one signed by an individual not authorized to bind the Offeror, may be disqualified.**

The Offeror's authorized official(s) must sign all required bid forms.
The Price Form in Section 3.0 must be completed. No substitute form will be accepted. Pricing must remain firm for the entire contract period.
All information in the Offeror's response should be clear and concise. The successful response will be incorporated into a contract as an exhibit; therefore, Offerors should not make claims to which they are not prepared to commit themselves contractually.
The successful Offeror must be an Equal Opportunity Employer.
The City of Somerville values a diverse workforce and believes it contributes to a work product and customer experience that best reflects the community in our city. Applicants are highly encouraged to include any certifications and documents that recognize the diversity of the Offeror's work force, including ownership of the offering firm/organization, executive leadership, management, and employees proposed for the work in Somerville, including diversity of sub-consultants. Please use the supplier diversity form (see Section 4.0) with supporting documentation to share your diversity data with the City.

1.2 Bid Schedule

Key dates for this Invitation for Bids:	
IFB Issued	3/4/2026
Deadline for Submitting Questions to IFB	3/12/2026 by 2PM EST
Bids Due	3/18/2026 by 3PM EST
Anticipated Contract Award	3/25/2026
Est. Contract Commencement Date	4/15/2026
Est. Contract Completion Date	12/31/2026 With two (2) additional one (1) year renewals at the City's sole discretion. If renewed for a second year, the start date will be 1/1/2027.

Responses must be delivered by 3/18/2026 by 3PM EST to:	City of Somerville Procurement & Contracting Services Department Attn: Felisa Gárate 93 Highland Avenue Somerville, MA 02143
--	---

1.3 Submission Instructions

If you are submitting your bid online via Bidexpress.com, then you do not need to also submit a sealed bid package as instructed below. Email is not an acceptable method of submission of bids.

Please submit *one sealed bid package* with the following contents and marked in the following manner:

Contents of Sealed Bid Package	Marked As
<p>Envelope 1: Sealed Bid: Shall Include (1) original and one (1) electronic copy. [Electronic copies are to be submitted on USB drives and are to be saved in Adobe Acrobat format. ("Read only" files are acceptable.)]</p>	<p>To Be Marked: IFB # 26-53 On-Call Repairs to Irrigation and Water Features</p>
<p>Please send the complete sealed package to the attention of :</p>	<p>Felisa Gárate Senior Procurement Manager Procurement & Contracting Services Department Somerville City Hall 93 Highland Avenue Somerville, MA 02143</p>
<p align="center">Live Bid Opening Link</p> <p>Join Zoom Meeting: https://us02web.zoom.us/j/83248050167?pwd=kkE2aQehMaU0S2YCDHFQz4WLrFL6OG.1</p> <p>Meeting ID: 832 4805 0167 Passcode: 659067</p>	
<p>Methods of Bid Submission</p> <p>Bidders may submit bids in any of the following ways. All bids will be timestamped and must be received no later than due date and time.</p> <ol style="list-style-type: none"> 1) Sealed bids can be sent to City Hall through the US Postal Service or other delivery service (e.g. FedEx, UPS). 2) BidExpress.com is an online bidding platform where bidders can submit all required documents. The fee to use this service is approximately \$50.00 unless your company has a subscription with BidExpress. You can access the bid package and forms via the City of Somerville BidExpress page at: https://www.bidexpress.com/businesses/33100/home 3) For any technical assistance while submitting the online bid, please contact the BidExpress Customer support team at www.bidexpress.com. 	

Bid Format

Responses shall be prepared on standard 8.5 x 11 inch paper (charts may be landscaped but must be on 8.5 x 11 inch paper) and shall be in a legible font size (12). All pages of each response shall be appropriately numbered (and with consecutive page numbering across tabs). **In an effort to reduce waste, we discourage the use of 3-ring binders.**

Elaborate format and binding are neither necessary nor desirable.

Qualifications & Experience

The Offeror may include any additional literature and product brochures. The Quality Requirements Form (Section 2), or set of basic business standards, must be submitted with bid.

References

The Offeror shall list at least three relevant references, which the City may contact. The City of Somerville reserves the right to use ourselves as a reference. References shall include the following information:

●The name, address, telephone number, and email address of each client listed above.	
●A description of the work performed under each contract.	●The amount of the contract.
●A description of the nature of the relationship between Offeror and the customer.	
●The dates of performance.	●The volume of the work performed.

1.4 Questions

Questions are due: 3/12/2026 by 2PM EST

Questions concerning this solicitation must be delivered in writing to:

Felisa Gárate
Senior Procurement Manager
Somerville City Hall
Procurement & Contracting Services Department
93 Highland Avenue
Somerville, MA 02143

Or emailed to:
fgarate@somervillema.gov

Or faxed to:

617-625-1344

Answers will be sent via an addendum to all Offerors who have registered as bid holders. Bidders are encouraged to contact the Procurement & Contracting Services Department to register as a bid document holder to automatically be alerted as to addenda as they are issued. It is the responsibility of the Offeror to also monitor the bid portal on the City's website for any updates, addenda, etc. regarding that specific solicitation. The web address is:

<https://www.somervillema.gov/procurement>.

Any bidders that contact City personnel outside of the Procurement & Contracting Services Department regarding this bid may be disqualified.

1.5 General Terms

Estimated Quantities

The City of Somerville has provided estimated quantities, which will be ordered/purchased over the course of the contract period. These estimates are estimates only and not guaranteed.

Bid Signature

A response must be signed as follows: 1) if the Offeror is an individual, by her/him personally; 2) if the Offeror is a partnership, by the name of the partnership, followed by the signature of each general partner; and 3) if the Offeror is a corporation, by the authorized officer, whose signature must be attested to by the clerk/secretary of the corporation (& with corporate seal).

Time for Bid Acceptance and City Contract Requirements

The contract will be awarded within 90 days after the bid opening. The time for award may be extended for up to 45 additional days by mutual agreement between the City and the apparent lowest responsive and responsible bidder. The Offeror's submission will remain in effect for a period of 90 days from the response deadline or until it is formally withdrawn, a contract is executed, or this solicitation is canceled, whichever occurs first. The Offeror will be required to sign a standard City contract per the City's general terms included herein as Part 2.

Holidays are as follows:

New Year's Day	Martin Luther King Day	Presidents' Day	Patriots' Day
Memorial Day	Juneteenth Independence Day	Independence Day	Labor Day
Indigenous Peoples' Day	Veterans' Day	Thanksgiving Day	Thanksgiving Friday
Christmas Eve (half day)	Christmas Day		

Please visit <http://www.somervillema.gov/> for the City's most recent calendar. *Under State Law, all holidays falling on Sunday must be observed on Monday.

If the awarded Offeror for their convenience desires to perform work during other than normal working hours or on other than normal work days, or if the Offeror is required to perform work at such times, the Offeror shall reimburse the City for any additional expense occasioned the City, thereby, such as, but not limited to, overtime pay for City employees, utilities service, etc. UNLESS otherwise specified in these provisions, services will be performed during normal work hours. When required services occur on holidays, work will be performed on either the previous or following work day, unless specified otherwise.

Unforeseen Office Closure

If, at the time of the scheduled bid opening, the Procurement & Contracting Services Department is closed due to uncontrolled events such as fire, snow, ice, wind, or building evacuation, the bid due date will be postponed until 2:00 p.m. on the next normal business day. Bids will be accepted until that date and time. In the event of inclement weather, the Offeror is responsible for listening to the media to determine if the City has been closed due to weather.

Changes & Addenda

If any changes are made to this solicitation, an addendum will be issued. All proposers on record as having picked up the solicitation will be alerted via email as to the posting of all addenda. The City will also post addenda on its website (<https://www.somervillema.gov/procurement>). No changes may be made to the solicitation documents by the Offerors without written authorization and/or an addendum from the Procurement & Contracting Services Department.

Modification or Withdrawal of Bids, Mistakes, and Minor Informalities

An Offeror may correct, modify, or withdraw a bid by written notice received by the City of Somerville prior to the time and date set for the bid opening. Bid modifications must be submitted in a sealed envelope clearly labeled "Modification No. ___" to the address listed in Section 1. Each modification must be numbered in sequence and must reference the original

solicitation. After the bid opening, an Offeror may not change any provision of the bid in a manner prejudicial to the interests of the City or fair competition. Minor informalities will be waived or the proposer will be allowed to correct them. If a mistake and the intended bid are clearly evident on the face of the bid document, the mistake will be corrected to reflect the intended correct bid, and the proposer will be notified in writing; the proposer may not withdraw the bid. A proposer may withdraw a bid if a mistake is clearly evident on the face of the bid document, but the intended correct bid is not similarly evident.

Right to Cancel/Reject Bids

The City of Somerville may cancel this solicitation, or reject in whole or in part any and all bids, if the City determines that cancellation or rejection serves the best interests of the City.

Unbalanced Bids

The City reserves the right to reject unbalanced, front-loaded, and conditional bids.

Brand Name “or Equal”

Any references to any brand name or proprietary product in the specifications shall require the acceptance of an equal or better brand. The City has the right to make the final determination as to whether an alternate brand is equal to the brand specified.

Electronic Funds Transfer (EFT)

For EFT payment, the following shall be included with invoices to the point of contact:

- Contract/Order number; Contractor’s name & address as stated in the contract;
- The signature (manual or electronic, as appropriate) title, and telephone number of the Offeror’s representative authorized to provide sensitive information;
- Name of financial institution; Financial institution nine (9) digit routing transit number;
- Offeror’s account number; Type of account, i.e., checking or saving.

Project Schedule

Bidders are instructed to note the firmness of the dates of: Substantial Completion, and Final Completion. For the purpose of meeting these deadlines, the City may be prepared to authorize extended work hours beyond those prescribed by City ordinance, to include work on Sundays with the prior permission of the City.

Contractor submission of all paperwork required for the Construction Contract, including but not limited to insurance certificates, performance and payment bonds, a certificate of good standing from the Secretary of Corporations, and signature pages shall be submitted to the Chief Procurement Officer no later than 5 working days from award of the contract.

The successful bidder shall be required to submit a preliminary construction schedule within 10 days of the established date of award of the Contract and a more detailed Gantt-type construction schedule within 15 days of the established award of the contract, which shows the dates of substantial and final completion.

Sales Tax Exemption

Materials, equipment, and supplies for this project are exempt from sales tax in accordance with M.G.L. Chapter 64H, Section 6 (d). The city will furnish the successful bidder with its sales tax exemption number.

Permit Fees (Contractor responsible for obtaining permits/City of Somerville permit fees waived)

DPW permits to obstruct or excavate the public streets and/or sidewalks; ISD building code permits; and Traffic and Parking permits; are waived by the City of Somerville. However, license fees are not waived by the City of Somerville. The Contractor shall pay all license fees (e.g., drain layer’s license fee). The City of Somerville Traffic and Parking Department must be contacted directly for all required permits. The vendor must also provide the City of Somerville Traffic and Parking Department with a traffic management plan, prior to the start of all work.

If water usage is required in the commitment of this project, the Contractor needs to contact the DPW Water Dept., and make arrangements for a water meter. There will be a charge for the water meter and the water usage.

The Contractor is responsible for obtaining EVERSOURCE work orders and for all costs and fees associated with EVERSOURCE.

Permits to excavate the public way cannot be issued until the applicant has notified the appropriate utility companies, as required by Massachusetts General Laws, Chapter 370 of the Acts of 1963. The applicant must either: 1) obtain written receipts from the affected utilities, and provide copies of same to the owner; or 2) utilize the Dig-Safe System for the required notifications, and also submit written notifications for those utilities not participating in the Dig-Safe System. Written notifications must state that utility companies have been notified and the contractor cleared to begin work.

<i>The following utility companies must be notified in writing:</i>		
M.B.T.A. Engineering and Maintenance Division 617-722-5454 Attn: Chief Engineer 500 Arborway Jamaica Plain, MA 02130	M.W.R.A. Sewer Division 617-242-6000 100 First Avenue Charlestown Navy Yard Boston, MA 02129	M.W.R.A. Water Division 617-242-6000 100 First Avenue Charlestown Navy Yard Boston, MA 02129
<i>The following utility companies must be notified in writing or through Dig-Safe:</i>		
Algonquin Gas Transmission Corp. 617-254-4050 Manager of Land and Public Relations 1284 Soldiers Field Road Brighton, MA 02135	Verizon 781-290-5154 460 Totten Pond Road Waltham, MA 02154	Boston Edison 617-541-5730 Right of Way 1165 Massachusetts Avenue Dorchester, MA 02125
Boston Gas Company 617-323-9210 201 Rivermoor Street West Roxbury, MA 02132	EVERSOURCE 617-497-1236, x4195 46 Blackstone Street Somerville, MA 02139	EVERSOURCE Steam 617-225-4568 Attn: Supervisor of Maintenance 265 First Street Somerville, MA 02142
EVERSOURCE Gas 617-369-5591 303 Third Street Somerville, MA 02142	A T & T Broadband 981-658-0400 760 Main Street Malden, MA 01887	Somerville Public Works Dept. 617-625-6600, x5200 One Franey Road Somerville, MA 02145
Somerville Fire Department 617-625-6600, x8100 266 Broadway Somerville, MA 02143	Dig-Safe 1-800-322-4844	

The contractor shall have all utilities marked out along the course of this work by such means as the Engineer shall approve and shall preserve such marked locations until the work has progressed to the point where the encountered utility is fully exposed and protected as required. It shall be the contractor's responsibility to notify utilities at least 48 hours prior to the start of any excavation.

The contractor is responsible for contacting any other utilities that are not listed herein.

Rodent Control

The Contractor shall retain the services of a licensed rodent exterminator to conduct an inspection of the work and laydown areas and report on the presence of rodents and take any necessary measures to eliminate rodent populations prior to start of work. All rodent control to be in place and approved prior to any equipment delivery or demolition.

A. Within ten (10) days after Notice to Proceed, submit to the Landscape Architect or Owners Representative a written description of rodent control measures to be used and the areas to be included.

B. Provide the names and background of the licensed rodent exterminator retained to provide any necessary rodent eradication measures prior to the start of work. The licensed rodent exterminator must be approved by the City Director of Inspectional Services.

C. Containers: Use metal or heavy-duty plastic refuse containers with tight fitting lids for disposal of all garbage, or trash associated with food. These containers shall not have opening that allow access by rodents.

Schedule of Values

Bidders do NOT need to include a Schedule of Values with their bid package. The successful bidder will be required to submit a refined and detailed schedule of values for review and approval by the design professional prior to signing the construction contract.

5% Bid Guaranty

All bids shall be accompanied by a bid bond or bank certified check or bank treasurer's check in the amount of 5% of the bid price, which shall become the property of the City of Somerville if the bid is accepted and the bidder neglects or refuses to comply with the terms of the bid.

Prevailing Wage Rate Requirements

The contractor shall pay Mass. Prevailing Wage Rates. The applicable prevailing wage rates are attached as part of this bid package and will be included in the resulting contract. Notwithstanding anything to the contrary, the City may, in its sole discretion withhold payment unless the City has in its possession payroll records that are complete, accurate, and current as of the date of said application for payment. A signed Compliance Form must be included with the bid package (form included).

a) The Contractor shall:

- Pay wages at least once a week;
- Submit payroll information on a weekly basis in a format approved by the City, numbered in numerical sequence and signed by the Contractor (including forms for weeks when the Contractor is not on the Project Site, in which case there shall be a notation to the effect "no work this payroll period" and a date anticipated for resuming work).

b) The Contractor shall submit to the City within the first week of construction:

- A list of apprenticeship programs with which the Contractor is affiliated;
- The number of apprentices that will be employed by the Contractor on the Project;
- A list of the Contractor's employee fringe benefits;
- A copy of each project schedule, including the anticipated commencement date for each Subcontractor; and
- A list of each Subcontractor's suppliers and material men.

c) The Contractor shall include language similar to the above in all subcontracts.

Reservation of Rights

The City reserves the right to extend the deadline for submission of bids, to waive minor informalities, and to reject any and all bids, if in its sole judgment, the best interests of the City of Somerville would be served by doing so.

Maintenance Manual and As-Built Drawing Requirements

Upon Final Completion of all construction, the contractor shall submit: two complete copies of a maintenance manual, and two copies of an as-built drawing set, with two USB copies of the as-built drawings. The City will not issue the final check for retainage until the submittal and approval of the maintenance manual and as-built drawings.

- 1) The Maintenance Manual shall be in the form of a three ring binder, organized and tabbed into appropriate sections, and shall include the following items:
 - A complete maintenance plan with recommended maintenance schedules and procedures for all systems including: HVAC, security (card access/cameras), fire suppression, irrigation, fertilization, and water systems shut-down procedures, etc., and all other applicable systems and procedures;
 - A letter from the contractor stating the period of warranty for all parts, materials, and workmanship, from the date of Final Completion;
 - A letter from the contractor stating the period of warranty for all systems (HVAC, irrigation, fire suppression, etc.);
 - All product information, product directions, and warranties;
 - List of all materials and sizes, etc.;
 - Copies of City permits with signatures of inspectors;
 - Contact information for all subcontractors including email addresses; and,
 - A record of all submittals and dates of approvals.

- 2) As-Built drawings shall be a complete and accurate record that incorporates any and all changes to the construction plan set issued at the time of contract initiation. As-built drawings shall be clearly marked and annotated and shall include but not be limited to: all field changes, change orders, and supplemental drawing provided by the architect/designer.

- 3) The USB hard drive shall include an electronic copy of all as-built drawings.

Police Details

Unless otherwise noted in the specifications, the Contractor will be responsible for requesting and paying for all necessary police details. These costs should be incorporated into the base bid amount. If use of the public way is required for staging, parking or deliveries, the Contractor is responsible for obtaining a Street Occupancy Permit, including a Traffic Management Plan (TMP) and for the cost of all police details.

Period of Performance

The period of performance for this contract begins on or about 4/15/2026 and ends on or about 12/31/2026 with two (2) additional one (1) year renewals at the City's sole discretion. If renewed for a second year, the start date will be 1/1/2027. If applicable, optional renewal years may be exercised by the sole discretion of the City (see cover page for anticipated contract term).

Place of Performance

All services, delivery, and other required support shall be conducted in Somerville and other locations designated by the Department point of contact. Meetings between the Vendor and City personnel shall be held at the City of Somerville, Massachusetts, unless otherwise specified.

Vendor Conduct

The Vendor's employees shall comply with all City regulations, policies, and procedures. The Vendor shall ensure that their employees present professional work attire at all times. The authorized contracting body of the City may, at his/her sole discretion, direct the Vendor to remove any Vendor employee from City facilities for misconduct or safety reasons. Such rule does not relieve the Vendor of their responsibility to provide sufficient and timely service. The City will provide the

Vendor with immediate written notice for the removal of the employee. Vendors must be knowledgeable of the conflict of interest law found on the Commonwealth's website <http://www.mass.gov/ethics/laws-and-regulations-/conflict-of-interest-information/conflict-of-interest-law.html>. Vendors may be required to take the Conflict of Interest exam.

Vendor Personnel

The Vendor shall clearly state the name of the proposed project manager. All proposed staff must demonstrate the ability to carry out the specified requirements.

Confidentiality

The Vendor agrees that it will ensure that its employees and others performing services under this contract will not use or disclose any non-public information unless authorized by the City. That includes confidential reports, information, discussions, procedures, and any other data that are collected, generated or resulting from the performance of this scope of work. All documents, photocopies, computer data, and any other information of any kind collected or received by the Vendor in connection with the contract work shall be provided to the City upon request at the termination of the contract (i.e., the date on which final payment is made on the contract or at such other time as may be requested by the City or as otherwise agreed by City and the Vendor). The Vendor may not discuss the contract work in progress with any outside party, including responding to media and press inquiries, without the prior written permission of the City. In addition, the Vendor may not issue news releases or similar items regarding contract award, any subsequent contract modifications, or any other contract-related matter without the prior written approval of the City. Requests to make such disclosures should be addressed in writing to the Vendor's point of contact.

OSHA

Pursuant to M.G.L. c. 30, sec. 395 (a)(2) all employees to be employed on the project must have successfully completed a course in construction safety and health approved by OSHA and of at least 10 hours in duration. The vendor shall comply with all applicable OSHA standards, guidance, and rules and regulations relative to providing a safe working environment, in connection with the performance of its agents, servants, employees, contractors, and subcontractors under the terms of this contract.

Other Applicable Laws

In addition to applicable federal and state laws, the City has several ordinances that apply to the services requested in this contract. Such ordinances include but are not limited to: [living wage ordinance](#), [ordinance to protect vulnerable road users](#), [responsible employer ordinance](#), and [ordinance to protect against wage theft](#). Workplace safety is of paramount importance to all workers who perform services on City contracts and all bidders must certify that they will disclose any citations they may have received for OSHA violations.

Notice and Certification Pursuant to Somerville Wage Theft Ordinance

All Offerors, bidders, respondents have an affirmative duty to report to the Procurement & Contracting Services Department and provide a copy of any criminal or civil judgment, administrative citation, or final administrative determination, order, or debarment, relating to wage theft, against the bidder or any of its subcontractors entered within the five years prior to bid submission.

If you are the successful bidder, you and any of your subcontractors have an affirmative duty to report any criminal or civil judgment, administrative citation, final administrative determination, order, or debarment against the bidder or any of its subcontractors while your contract with the City is in effect, within five business days of receipt.

You may not contract with the City if you have been either voluntarily or involuntarily debarred by the federal government, any agency of the Commonwealth of Massachusetts or any other state for the entire term of the debarment.

You may not use any subcontractor who has been debarred by the federal government or any state government during the period of that subcontractor's debarment.

You must post notices in accordance with M.G.L. c. 151 § 16 in a conspicuous location accessible to all of their employees in English and the primary language of the employee(s) at the particular workplace.

If not all employees would have reasonable access to the notice if posted in a single location, then you must inform the purchasing agent or other City Department of the number and location of postings in order to ensure that you provide reasonable notice to all of your employees.

As a condition of this bid, the bidder (a.k.a. Offeror, respondent) hereby certifies that neither the bidder nor any of the bidder's subcontractors have been subject to a criminal or civil judgment, administrative citation, final administrative determination, order, or debarment resulting from a violation of M.G.L. c. 149, M.G.L. c. 151, or 29 U.S.C. § 201 et seq. within five years prior to bid submission.

In the alternative, the Bidder hereby discloses a criminal or civil judgment, administrative citation, administrative determination, or debarment, within five years prior to bid submission. Included with the Bid is a copy of the same, in addition to documentation demonstrating that all damages, fines, costs, and fees have been paid.

IFB # 26-53
SECTION 2.0
RULE FOR AWARD /
PROJECT INFORMATION

2.1 Rule For Award

The contract shall be awarded to the responsible and eligible Bidder submitting the lowest total price. The contract will be awarded within ninety (90) days after the bid opening. The time for award may be extended for up to 45 additional days by mutual agreement between the City and the apparent lowest responsive and responsible bidder.

2.2 Background

Project Information	
Managing City Department:	DPW
Project Manager:	Ben Waldrip
Project Manager Email:	bwaldrip@somervillema.gov
Project Address:	Various locations throughout the City of Somerville, MA
Brief Project Description:	Labor, material, and equipment for on-call irrigation and pressurized water system repairs, as described in Part 3: Technical Specifications of this document.
Estimated Project Cost:	\$90,000 for 3 years (\$30,000 annually)
Liquidated Damages	N/A
Project Schedule	
Estimated Award Date:	3/25/2026
Estimated Start Date:	4/15/2026

2.3 Minimum Quality Requirements

Quality requirements, or basic business requirements, are the minimum set of standards that an entity must meet and certify to be considered responsible and responsive. **Please complete the Quality Requirements form, below, and submit it with your completed bid.** The City of Somerville will disqualify any response that does not meet the minimum quality requirements. A "No" response to items 1 through 5 or a failure to respond to any of the following minimum standards, will result in disqualification of your bid.

QUALITY REQUIREMENTS		YES	NO
1.	Has the Contractor been established in the business of Irrigation for at least five (5) years?		
2.	Can the Contractor provide all the services mentioned in the scope of work?		
3.	Have you provided at least one (1) reference demonstrating experience working with Watertronics systems?		
4.	Have you assigned one individual as the Contractor's primary representative to the City? Have you indicated the individual's name with your bid documentation?		
5.	Can the Vendor certify that all employees to be provided, have successfully completed at least 10 hours of OSHA approved training in Construction Safety and Health?		
6.	Optional: Are you a Mass. Supplier Diversity Office MBE/WBE certified minority or woman owned business? Additional minority designations may be submitted by attaching supporting documentation.		

In order to provide verification of affirmative responses to items 1 through 5 under the quality requirements listed in the Quality Requirements Form, Offeror must submit written information that details the general background, experience, and qualifications of the organization. Subcontractors, if applicable, must be also included.

SECTION 3.0 FORM FOR GENERAL BID

The undersigned proposes to furnish all labor and materials required for: On-Call Repairs to Irrigation and Water Features

In accordance with the accompanying plans and specifications prepared by The Department of Public Works and specified below, subject to additions and deductions according to the terms of the specifications.

The bidder certifies the following bulleted statements and offers to supply and deliver the materials and services specified below in full accordance with the Contract Documents supplied by the City of Somerville

- The bids will be received at the office of the Chief Procurement Officer, Somerville City Hall, 93 Highland Avenue, Somerville, MA 02143 no later than **3/18/2026 by 3PM EST**
- If the **awarded** vendor is a Corporation a “Certificate of Good Standing” (produced by the Mass. Sec. of State) must be furnished with the resulting contract (see Section 4.0.)
- **Awarded Vendor** must comply with Living Wage requirements (see Section 4.0; only for services)
- **Awarded Vendor** must comply with all applicable laws, including but not limited to the [Somerville Wage Theft Ordinance](#).
- **Awarded Vendor** must comply with insurance requirements as stated in Section 4.0.
- The Chief Procurement Officer reserves the right to accept or reject any or all bids and/or to waive any informalities if in her/his sole judgment it is deemed to be in the best interest of the City of Somerville.
- The following prices shall include delivery, the cost of fuel, the cost of labor, and all other charges.
- This form to be enclosed in sealed bid package.

Section A. On-Call Labor for Irrigation & Pressurized Water Systems

Labor Category	Estimated Hours	Year 1 – 2026		Year 2 – 2027		Year 3 – 2028	
		Hourly Rate	Total Cost (Hourly Rate × Est. Hours)	Hourly Rate	Total Cost (Hourly Rate × Est. Hours)	Hourly Rate	Total Cost (Hourly Rate × Est. Hours)
Regular Hours: Mon–Sat, 7:00 AM– 4:30 PM	100	\$	\$	\$	\$	\$	\$
Emergency Hours: Mon–Sat 4:31 PM–6:59 AM, Sundays & Holidays	20	\$	\$	\$	\$	\$	\$
Annual Totals: Sum of Total Cost for each year		\$		\$		\$	
Subtotal Section A: Sum of Annual Totals for All 3 Years		\$					

Section B. Budget for Parts & Materials

Vendor will provide materials according to one of the following cost structures: (1) at Cost, (2) a flat percentage Discount, or (3) a flat percentage Mark-up.

Option 1: Parts & Materials at Cost

	Year 1 – 2025	Year 2 – 2026	Year 3 – 2027
Estimated Annual Budget for Parts & Materials	\$10,000.00	\$10,000.00	\$10,000.00
Estimated Annual Totals for Parts & Materials at Cost	\$	\$	\$

Option 2: Parts & Materials at Discount

Estimated Annual Budget for Parts & Materials	\$10,000.00	\$10,000.00	\$10,000.00
Discount Rate	%	%	%
Discount Amount \$10,000.00 × Discount Rate	– \$	– \$	– \$
Estimated Annual Totals for Parts & Materials at Discount \$10,000.00 – Discount Amount	\$	\$	\$

Option 3: Parts & Materials at Markup

Estimated Annual Budget for Parts & Materials	\$10,000.00	\$10,000.00	\$10,000.00
Mark-up Rate	%	%	%
Mark-up Amount \$10,000.00 × Mark-up Rate	+ \$	+ \$	+ \$
Estimated Annual Totals for Parts & Materials at Mark-up \$10,000.00 + Mark-up Amount	\$	\$	\$

Subtotal Section B: Sum of Estimated Annual Totals for Parts & Materials for All 3 Years	\$
--	----

Section C. Total Bid Pricing

	Year 1 – 2026	Year 2 – 2027	Year 3 – 2028
Annual Bid Totals: Annual Total Section A + Annual Total Section B for each year	\$	\$	\$
Total Bid Price: Annual Bid Total Year 1 + Annual Bid Total Year 2 + Annual Bid Total Year 3	\$		

In the alternative, the Bidder hereby discloses a criminal or civil judgment, administrative citation, administrative determination, or debarment, within five years prior to bid submission. Included with the Bid is a copy of the same, in addition to documentation demonstrating that all damages, fines, costs, and fees have been paid.

The Undersigned Bidder has submitted all requested referenced information on the Reference Form.

The Undersigned Bidder understands that the contractor and subcontractors will be required to pay prevailing wages to laborers and mechanics, and that if the Undersigned's bid is significantly below the average bid, the Awarding Authority may require the Bidder to substantiate that the bid is based on payment of wages at prevailing rates.

The Undersigned Bidder certifies that it can achieve substantial and final completion by the dates notes in Section 2.2, herein, unless otherwise noted in the Notice to Proceed as delivered to the awarded vendor.

Should certain additional work be required, or should the quantities of certain classes of work be increased or decreased from those required by the Contract Documents, by authorization of the City, unit prices listed on the attached "Unit Price Form" shall at the option of the City be the basis of payment to the Contractor or credit to the City, for such increase or decrease in the work. The unit prices shall represent the exact net amount per unit to be paid the Contractor (in the case of addition or increase) or to be refunded the City (in the case of decrease). Contractually noted adjustments will be allowed for overhead, profit, insurance or other direct or indirect expenses of the Contractor or Subcontractors.

The unit prices shall include cost of fuel, all labor, materials, equipment, overhead, profit, insurance, etc. to cover the finished work of the several kinds called for. Changes shall be processed in accordance with the provisions of the General Conditions governing changes in the work.

Executed this _____ day of _____, 20____.

Name of Company/Individual:

Address, City, State, Zip:

Tel #

Email:

Name and Title of Person Signing

Signature of Authorized Individual

Please acknowledge receipt of any and all Addenda (if applicable) by signing below and including this form in your bid package. Failure to do so may subject the proposer to disqualification.

ACKNOWLEDGEMENT OF ADDENDA:

Addendum #1 _____ #2 _____ #3 _____ #4 _____ #5 _____ #6 _____ #7 _____ #8 _____ #9 _____ #10 _____

IFB # 26-53

SECTION 4.0

On-Call Repairs to Irrigation and Water Features
**REQUIRE BID FORMS /
BIDDERS' CHECKLIST**

Please ensure all documents listed on this checklist are included with your bid. Failure to do so may subject the proposer to disqualification.

Required with Sealed Bids

	Signed Cover Letter
	Form for General Bid
	Unit Price Form (if applicable)
	Somerville Living Wage Form
	Quality Requirements Form (Section 2.0)
	Certificate of Non-Collusion & Tax Compliance
	Certificate of Signature Authority
	Reference Form (or equivalent may be attached)
	5% Bid Deposit
	Prevailing / Davis Bacon Wages Statement of Compliance Form
	Wage Theft Certification Form
	OSHA Form
	Vulnerable Road Users Ordinance
	Acknowledgement of Addenda (if applicable)
	Signed W9

Required with Contract, *Post Award*

	Certificate of Good Standing from Secretary of State (furnish with bid if available)
	Certificate of Insurance (furnish sample certificate with bid, if possible)
	Statement of Management (if applicable)
	Payment Bond (50% of Contract Value)



**City of Somerville Department of Public Works
Communication Form**

Name/Business Name of Contact for Service During Business Hours (M-F 7am -3pm)

Please Print

Direct phone number to request service During Business Hours (M-F 7am-3pm)

(____) _____

❖ **Emergency, on call service contact (if applicable)**

Phone number after business hours, holidays, and weekends.

(____) _____

Accounts Payable/Receivable Information

Name of Contact: Accounts processing

Name: _____

Phone: _____

E-mail: _____

Please Print



SOMERVILLE LIVING WAGE ORDINANCE CERTIFICATION FORM
CITY OF SOMERVILLE CODE OF ORDINANCES SECTION 2-397 et seq.*

Instructions: This form shall be included in all Invitations for Bids and Requests for Proposals which involve the furnishing of labor, time or effort (with no end product other than reports) by vendors contracting or subcontracting with the City of Somerville, where the contract price meets or exceeds the following dollar threshold: \$10,000. If the undersigned is selected, this form will be attached to the contract or subcontract and the certifications made herein shall be incorporated as part of such contract or subcontract. **Complete this form and sign and date where indicated below on page 2.**

Purpose: The purpose of this form is to ensure that such vendors pay a “Living Wage” (defined below) to all covered employees (i.e., all employees except individuals in a city, state or federally funded youth program). In the case of bids, the City will award the contract to the lowest responsive and responsible bidder paying a Living Wage. In the case of RFP’s, the City will select the most advantageous proposal from a responsive and responsible offeror paying a Living Wage. In neither case, however, shall the City be under any obligation to select a bid or proposal that exceeds the funds available for the contract.

Definition of “Living Wage”: For this contract or subcontract, as of 7/1/2025 “Living Wage” shall be deemed to be an hourly wage of no less than \$18.28 per hour. From time to time, the Living Wage may be upwardly adjusted and amendments, if any, to the contract or subcontract may require the payment of a higher hourly rate if a higher rate is then in effect.

CERTIFICATIONS

1. The undersigned shall pay no less than the Living Wage to all covered employees who directly expend their time on the contract or subcontract with the City of Somerville.
2. The undersigned shall post a notice, (copy enclosed), to be furnished by the contracting City Department, informing covered employees of the protections and obligations provided for in the Somerville Living Wage Ordinance, and that for assistance and information, including copies of the Ordinance, employees should contact the contracting City Department. Such notice shall be posted in each location where services are performed by covered employees, in a conspicuous place where notices to employees are customarily posted.
3. The undersigned shall maintain payrolls for all covered employees and basic records relating hereto and shall preserve them for a period of three years. The records shall contain the name and address of each employee, the number of hours worked, the gross wages, a copy of the social

* Copies of the Ordinance are available upon request to the Procurement & Contracting Services Department.

Form: _____
Contract Number: _____

security returns, and evidence of payment thereof and such other data as may be required by the contracting City Department from time to time.

4. The undersigned shall submit payroll records to the City upon request and, if the City receives information of possible noncompliance with the provisions the Somerville Living Wage Ordinance, the undersigned shall permit City representatives to observe work being performed at the work site, to interview employees, and to examine the books and records relating to the payrolls being investigated to determine payment of wages.

5. The undersigned shall not fund wage increases required by the Somerville Living Wage Ordinance by reducing the health insurance benefits of any of its employees.

6. The undersigned agrees that the penalties and relief set forth in the Somerville Living Wage Ordinance shall be in addition to the rights and remedies set forth in the contract and/or subcontract.

CERTIFIED BY:

Signature: _____
(Duly Authorized Representative of Vendor)

Title: _____

Name of Vendor: _____

Date: _____

INSTRUCTIONS: PLEASE POST

**NOTICE TO ALL EMPLOYEES
REGARDING PAYMENT OF LIVING WAGE**

Under the Somerville, Massachusetts' Living Wage Ordinance (Ordinance No. 1999-1), any person or entity who has entered into a contract with the City of Somerville is required to pay its employees who are involved in providing services to the City of Somerville no less than a "Living Wage".

The Living Wage as of **7/1/2025** is **\$18.28** per hour.

For assistance and information regarding the protections and obligations provided for in the Living Wage Ordinance and/or a copy of the Living Wage Ordinance, all employees should contact the City of Somerville's Procurement & Contracting Services Department directly.



Non-Collusion Form and Tax Compliance Certification

Instructions: Complete each part of this two-part form and sign and date where indicated below.

A. NON-COLLUSION FORM

I, the undersigned, hereby certify under penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person.

As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

Signature: _____
(Individual Submitted Bid or Proposal)
Duly Authorized

Name of Business or Entity: _____

Date: _____

B. TAX COMPLIANCE CERTIFICATION

Pursuant to M.G.L. c. 62C, §49A, I certify under the penalties of perjury that, to the best of my knowledge and belief, I am in compliance with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting child support, as well as paid all contributions and payments in lieu of contributions pursuant to MGL 151A, §19A(b).

Signature: _____
(Duly Authorized Representative of Vendor)

Name of Business or Entity: _____

Social Security Number or Federal Tax ID#: _____

Date: _____



**Certificate of Authority
(Corporations Only)**

Instructions: Complete this form and sign and date where indicated below.

1. I hereby certify that I, the undersigned, am the duly elected Clerk/Secretary of

(Insert Full Name of Corporation)

2. I hereby certify that the following individual _____
(Insert the Name of Officer who Signed the Contract and Bonds)

is the duly elected _____ of said Corporation.
(Insert the Title of the Officer in Line 2)

3. I hereby certify that on _____
(Insert Date: Must be on or before Date Officer Signed Contract/Bonds)

at a duly authorized meeting of the Board of Directors of said corporation, at which a quorum was present, it was voted that

(Insert Name of Officer from Line 2) (Insert Title of Officer from Line 2)

of this corporation be and hereby is authorized to make, enter into, execute, and deliver contracts and bonds in the name and on behalf of said corporation, and affix its Corporate Seal thereto, and such execution of any contract of obligation in this corporation's name and on its behalf, with or without the Corporate Seal, shall be valid and binding upon this corporation; and that the above vote has not been amended or rescinded and remains in full force and effect as of the date set forth below.

4. **ATTEST:**

Signature: _____
(Clerk or Secretary)

AFFIX CORPORATE SEAL HERE

Printed Name: _____

Printed Title: _____

Date: _____

(Date Must Be on or after Date Officer Signed Contract/Bonds)



**Certificate of Authority
(Limited Liability Companies Only)**

Instructions: Complete this form and sign and date where indicated below.

1. I, the undersigned, being a member or manager of

(Complete Name of Limited Liability Company)

a limited liability company (LLC) hereby certify as to the contents of this form for the purpose of contracting with the City of Somerville.

2. The LLC is organized under the laws of the state of: _____.

3. The LLC is managed by **(check one)** a Manager or by its Members.

4. I hereby certify that each of the following individual(s) is:

- a member/manager of the LLC;
- duly authorized to execute and deliver this contract, agreement, and/or other legally binding documents relating to any contract and/or agreement on behalf of the LLC;
- duly authorized to do and perform all acts and things necessary or appropriate to carry out the terms of this contract or agreement on behalf of the LLC; and
- that no resolution, vote, or other document or action is necessary to establish such authority.

<u>Name</u>	<u>Title</u>

5. **Signature:**_____

Printed Name: _____

Printed Title:_____

Date: _____

REFERENCE FORM

Bidder: _____

IFB Title: _____

Bidder must provide references for: Three other similar sized Municipalities provided the same services

Reference: _____ Contact: _____

Address: _____ Phone: _____

_____ Email: _____

Description and date(s) of supplies or services provided: _____

Reference: _____ Contact: _____

Address: _____ Phone: _____

_____ Email: _____

Description and date(s) of supplies or services provided: _____

Reference: _____ Contact: _____

Address: _____ Phone: _____

_____ Email: _____

Description and date(s) of supplies or services provided: _____



SOMERVILLE SUPPLIER DIVERSITY CERTIFICATION FORM

Background

The City of Somerville is an equal opportunity employer and encourages businesses to apply to work with the City that are representative of the City's diverse community. In an effort to increase the opportunities for disadvantaged and small businesses within Somerville and surrounding communities, the City recognizes Massachusetts' Operational Services Division's Supplier Diversity Office certification program.

Application Process

Applicable parties may learn more about the Commonwealth's supplier diversity certification process and apply here <https://www.mass.gov/supplier-diversity-office>. During the certification process, which takes approximately 30 days, the SDO investigates applicant companies to make sure they meet applicable legal requirements. Under SDO regulations, the applicant firm must prove it is at least 51% owned and dominantly controlled by adult minority, women, Portuguese, or veteran principals who are U.S. citizens or lawful permanent residents. Firms also must be ongoing and independent.

Certifications

Check all those that apply:

- Minority Business Enterprises (MBE)**
- Women Business Enterprises (WBE)**
- Veteran Business Enterprises (VBE)**
- Portuguese Business Enterprises (PBE)**
- Other** _____

The undersigned certifies that the applicant has received certification from the Massachusetts Supplier Diversity Office for the SDO category/categories listed above and has provided the City of Somerville with a copy of the SDO certification letter.

CERTIFIED BY:

Signature: _____

(Duly Authorized Representative of Vendor)

Title: _____

Name of Vendor: _____

Date: _____

WEEKLY PAYROLL RECORDS REPORT & STATEMENT OF COMPLIANCE

In accordance with Massachusetts General Law c. 149, §27B, a true and accurate record must be kept of all persons employed on the public works project for which the enclosed rates have been provided. A Payroll Form is available from the Department of Labor Standards (DLS) at www.mass.gov/dols/pw and includes all the information required to be kept by law. Every contractor or subcontractor is required to keep these records and preserve them for a period of three years from the date of completion of the contract.

On a weekly basis, every contractor and subcontractor is required to submit a certified copy of their weekly payroll records to the awarding authority; this includes the payroll forms and the Statement of Compliance form. The certified payroll records must be submitted either by regular mail or by e-mail to the awarding authority. Once collected, the awarding authority is required to preserve those records for three years from the date of completion of the project.

Each such contractor and subcontractor shall furnish weekly **and** within 15 days after completion of its portion of the work, to the awarding authority directly by first-class mail or e-mail, a statement, executed by the contractor, subcontractor or by any authorized officer thereof who supervised the payment of wages, this form, accompanied by their payroll:

STATEMENT OF COMPLIANCE

_____, 20_____

I, _____, _____
(Name of signatory party) (Title)

do hereby state:

That I pay or supervise the payment of the persons employed by

_____ on the _____
(Contractor, subcontractor or public body) (Building or project)

and that all mechanics and apprentices, teamsters, chauffeurs and laborers employed on said project have been paid in accordance with wages determined under the provisions of sections twenty-six and twenty-seven of chapter one hundred and forty nine of the General Laws.

Signature _____

Title _____

MASSACHUSETTS WEEKLY CERTIFIED PAYROLL REPORT FORM



Company's Name:		Address:				Phone No.:			Payroll No.:									
Employer's Signature:		Title:				Contract No:			Tax Payer ID Number		Work Week Ending:							
Awarding Authority's Name:		Public Works Project Name:				Public Works Project Location:			Min. Wage Rate Sheet Number									
General / Prime Contractor's Name:		Subcontractor's Name:							"Employer" Hourly Fringe Benefit Contributions									
												(B+C+D+E)	(A x F)					
Employee Name & Complete Address	Work Classification:	Employee is OSHA 10 certified (?)	Appr. Rate (%)	Hours Worked							Project Hours (A) All Other Hours	Hourly Base Wage (B)	Health & Welfare Insurance (C)	ERISA Pension Plan (D)	Supp. Unemp. (E)	Total Hourly Prev. Wage (F)	Project Gross Wages	Check No. (H)
				Su.	Mo.	Tu.	We.	Th.	Fr.	Sa.							Total Gross Wages	

Are all apprentice employees identified above currently registered with the MA DLS's Division of Apprentice Standards? YES NO

For all apprentices performing work during the reporting period, attach a copy of the apprentice identification card issued by the Massachusetts Department of Labor Standards / Division of Apprentice Standards. No apprentices are identified above

NOTE: Pursuant to MGL c. 149, s. 27B, every contractor and subcontractor is required to submit a **true and accurate** copy of their certified weekly payroll records to the awarding authority by first-class mail or e-mail. In addition, each weekly payroll must be accompanied by a statement of compliance signed by the employer. Failure to comply may result in the commencement of a criminal action or the issuance of a civil citation.

Date Received by Awarding Authority / /
--



**THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS
Prevailing Wage Rates**

MAURA HEALEY
Governor

KIM DRISCOLL
Lt. Governor

As determined by the Director under the provisions of the
Massachusetts General Laws, Chapter 149, Sections 26 to 27H

LAUREN JONES
Secretary

MICHAEL FLANAGAN
Director

Awarding Authority: Somerville **City/Town:** SOMERVILLE
Contract Number: IFB 26-53
Description of Work: Furnish labor, materials and equipment required to perform maintenance, on-call repair and installation of irrigation systems, water features, drinking fountains, and spigots.
Job Location: Various locations in Somerville, MA

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, the awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. The updated wage schedule must be provided to all contractors, including general and sub-contractors, working on the construction project.
- This annual update requirement is generally not applicable to 27F “rental of equipment” contracts. For such contracts, the prevailing wage rates issued by DLS shall remain in effect for the duration of the contract term. However, if the prevailing wage rate sheet issued does not contain wage rates for each year covered by the contract term, the Awarding Authority must request updated rate sheets from DLS and provide them to the contractor to ensure the correct rates are being paid throughout the duration of the contract. Additionally, if an Awarding Authority exercises an option to renew or extend the contract term, they must request updated rate sheets from DLS and provide them to the contractor.
- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the “Wage Request Number” on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or a sub-contractor.
- Apprentices working on the project are required to be registered with the Massachusetts Division of Apprentice Standards (DAS). Apprentices must keep their apprentice identification card on their persons during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DAS regardless of whether they are registered with another federal, state, local, or private agency must be paid the journeyworker’s rate.**
- Every contractor or subcontractor working on the construction project must submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee’s name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. For a sample payroll reporting form go to <http://www.mass.gov/dols/pw>.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Contractors must obtain the wage schedules from awarding authorities. Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may file a complaint with the Fair Labor Division of the office of the Attorney General at (617) 727-3465.

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
(2 AXLE) DRIVER - EQUIPMENT	12/1/2025	\$42.05	\$15.41	\$21.78	\$0.00	\$0.00	\$79.24
TEAMSTERS JOINT COUNCIL NO. 10	6/1/2026	\$43.05	\$15.41	\$21.78	\$0.00	\$0.00	\$80.24
TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	8/1/2026	\$43.05	\$15.91	\$21.78	\$0.00	\$0.00	\$80.74
	12/1/2026	\$43.05	\$15.91	\$23.52	\$0.00	\$0.00	\$82.48
(3 AXLE) DRIVER - EQUIPMENT	12/1/2025	\$41.12	\$15.41	\$21.78	\$0.00	\$0.00	\$78.31
TEAMSTERS JOINT COUNCIL NO. 10	6/1/2026	\$43.12	\$15.41	\$21.78	\$0.00	\$0.00	\$80.31
TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	8/1/2026	\$43.12	\$15.91	\$21.78	\$0.00	\$0.00	\$80.81
	12/1/2026	\$43.12	\$15.91	\$23.52	\$0.00	\$0.00	\$82.55
(4 & 5 AXLE) DRIVER - EQUIPMENT	12/1/2025	\$42.24	\$15.41	\$21.78	\$0.00	\$0.00	\$79.43
TEAMSTERS JOINT COUNCIL NO. 10	6/1/2026	\$43.24	\$15.41	\$21.78	\$0.00	\$0.00	\$80.43
TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	8/1/2026	\$43.24	\$15.91	\$21.78	\$0.00	\$0.00	\$80.93
	12/1/2026	\$43.24	\$15.91	\$23.52	\$0.00	\$0.00	\$82.67
ADS/SUBMERSIBLE PILOT	1/1/2024	\$117.16	\$10.08	\$11.62	\$12.67	\$0.00	\$151.53
PILE DRIVER LOCAL 56							
PILE DRIVER LOCAL 56 (ZONE 1)							
For apprentice rates see "Apprentice- PILE DRIVER"							
AIR TRACK OPERATOR	12/1/2025	\$48.60	\$10.65	\$9.75	\$9.65	\$0.00	\$78.65
LABORERS	6/1/2026	\$49.40	\$10.65	\$9.75	\$9.65	\$0.00	\$79.45
LABORERS - ZONE 1	12/1/2026	\$51.65	\$10.65	\$9.75	\$9.65	\$0.00	\$81.70
	6/1/2027	\$53.25	\$10.65	\$9.75	\$9.65	\$0.00	\$83.30
	12/1/2027	\$54.85	\$10.65	\$9.75	\$9.65	\$0.00	\$84.90
	6/1/2028	\$56.53	\$10.65	\$9.75	\$9.65	\$0.00	\$86.58
	12/1/2028	\$58.20	\$10.65	\$9.75	\$9.65	\$0.00	\$88.25
For apprentice rates see "Apprentice- LABORER"							
AIR TRACK OPERATOR (HEAVY & HIGHWAY)	12/1/2025	\$48.70	\$10.65	\$9.75	\$9.65	\$0.00	\$78.75
LABORERS	6/1/2026	\$50.25	\$10.65	\$9.75	\$9.65	\$0.00	\$80.30
LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2026	\$51.75	\$10.65	\$9.75	\$9.65	\$0.00	\$81.80
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
ASBESTOS REMOVER - PIPE / MECH. EQUIPT.	12/1/2025	\$44.80	\$14.50	\$4.30	\$6.75	\$0.00	\$70.35
HEAT & FROST INSULATORS LOCAL 6							
HEAT & FROST INSULATORS LOCAL 6 (BOSTON)							
ASPHALT RAKER	12/1/2025	\$48.10	\$10.65	\$9.75	\$9.65	\$0.00	\$78.15
LABORERS	6/1/2026	\$49.65	\$10.65	\$9.75	\$9.65	\$0.00	\$79.70
LABORERS - ZONE 1	12/1/2026	\$51.15	\$10.65	\$9.75	\$9.65	\$0.00	\$81.20
	6/1/2027	\$52.75	\$10.65	\$9.75	\$9.65	\$0.00	\$82.80
	12/1/2027	\$54.35	\$10.65	\$9.75	\$9.65	\$0.00	\$84.40
	6/1/2028	\$56.03	\$10.65	\$9.75	\$9.65	\$0.00	\$86.08
	12/1/2028	\$57.70	\$10.65	\$9.75	\$9.65	\$0.00	\$87.75
For apprentice rates see "Apprentice- LABORER"							
ASPHALT RAKER (HEAVY & HIGHWAY)	12/1/2025	\$48.20	\$10.65	\$9.75	\$9.65	\$0.00	\$78.25
LABORERS	6/1/2026	\$49.75	\$10.65	\$9.75	\$9.65	\$0.00	\$79.80
LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2026	\$51.25	\$10.65	\$9.75	\$9.65	\$0.00	\$81.30

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE	12/1/2025	\$59.28	\$16.05	\$13.25	\$3.25	\$0.00	\$91.83
OPERATING ENGINEERS LOCAL 4	6/1/2026	\$60.58	\$16.05	\$13.25	\$3.25	\$0.00	\$93.13
OPERATING ENGINEERS LOCAL 4	12/1/2026	\$62.03	\$16.05	\$13.25	\$3.25	\$0.00	\$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
BACKHOE/FRONT-END LOADER	12/1/2025	\$59.28	\$16.05	\$13.25	\$3.25	\$0.00	\$91.83
OPERATING ENGINEERS LOCAL 4	6/1/2026	\$60.58	\$16.05	\$13.25	\$3.25	\$0.00	\$93.13
OPERATING ENGINEERS LOCAL 4	12/1/2026	\$62.03	\$16.05	\$13.25	\$3.25	\$0.00	\$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
BARCO-TYPE JUMPING TAMPER	12/1/2025	\$48.10	\$10.65	\$9.75	\$9.65	\$0.00	\$78.15
LABORERS	6/1/2026	\$49.65	\$10.65	\$9.75	\$9.65	\$0.00	\$79.70
LABORERS - ZONE 1	12/1/2026	\$51.15	\$10.65	\$9.75	\$9.65	\$0.00	\$81.20
	6/1/2027	\$52.75	\$10.65	\$9.75	\$9.65	\$0.00	\$82.80
	12/1/2027	\$54.35	\$10.65	\$9.75	\$9.65	\$0.00	\$84.40
	6/1/2028	\$56.03	\$10.65	\$9.75	\$9.65	\$0.00	\$86.08
	12/1/2028	\$57.70	\$10.65	\$9.75	\$9.65	\$0.00	\$87.75
For apprentice rates see "Apprentice- LABORER"							
BLOCK PAVER, RAMMER / CURB SETTER	12/1/2025	\$48.60	\$10.65	\$9.75	\$9.65	\$0.00	\$78.65
LABORERS	6/1/2026	\$49.40	\$10.65	\$9.75	\$9.65	\$0.00	\$79.45
LABORERS - ZONE 1	12/1/2026	\$51.65	\$10.65	\$9.75	\$9.65	\$0.00	\$81.70
	6/1/2027	\$53.25	\$10.65	\$9.75	\$9.65	\$0.00	\$83.30
	12/1/2027	\$54.85	\$10.65	\$9.75	\$9.65	\$0.00	\$84.90
	6/1/2028	\$56.53	\$10.65	\$9.75	\$9.65	\$0.00	\$86.58
	12/1/2028	\$58.20	\$10.65	\$9.75	\$9.65	\$0.00	\$88.25
For apprentice rates see "Apprentice- LABORER"							
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY)	12/1/2025	\$48.70	\$10.65	\$9.75	\$9.65	\$0.00	\$78.75
LABORERS	6/1/2026	\$50.25	\$10.65	\$9.75	\$9.65	\$0.00	\$80.30
LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2026	\$51.75	\$10.65	\$9.75	\$9.65	\$0.00	\$81.80
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
BOILER MAKER	1/1/2024	\$48.12	\$7.07	\$14.60	\$6.00	\$0.00	\$75.79
BOILERMAKERS LOCAL 29							
BOILERMAKERS LOCAL 29							

Apprentice: BOILER MAKER							
Effective Date: 1/1/2024							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	65.00	\$31.28	\$7.07	\$9.32	\$3.90	\$0.00	\$51.57
2	65.00	\$31.28	\$7.07	\$9.32	\$3.90	\$0.00	\$51.57
3	70.00	\$33.68	\$7.07	\$10.03	\$4.20	\$0.00	\$54.98
4	75.00	\$36.09	\$7.07	\$10.74	\$4.50	\$0.00	\$58.40
5	80.00	\$38.50	\$7.07	\$11.45	\$4.80	\$0.00	\$61.82
6	85.00	\$40.90	\$7.07	\$12.18	\$5.10	\$0.00	\$65.25

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice: BOILER MAKER							
Effective Date: 1/1/2024							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
7	90.00	\$43.31	\$7.07	\$12.88	\$5.40	\$0.00	\$68.66
8	95.00	\$45.71	\$7.07	\$13.62	\$5.70	\$0.00	\$72.10
Apprentice to Journeyworker Ratio: 1:4							
BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)	2/1/2026	\$67.95	\$12.84	\$15.57	\$8.02	\$0.00	\$104.38
BRICKLAYERS LOCAL 3	8/1/2026	\$70.15	\$12.84	\$15.57	\$8.02	\$0.00	\$106.58
BRICKLAYERS LOCAL 3 (BOSTON)	2/1/2027	\$71.55	\$12.84	\$15.57	\$8.02	\$0.00	\$107.98
Apprentice: BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)							
Effective Date: 2/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	\$33.98	\$12.84	\$15.57	\$8.02	\$0.00	\$70.41
2	60.00	\$40.77	\$12.84	\$15.57	\$8.02	\$0.00	\$77.20
3	70.00	\$47.57	\$12.84	\$15.57	\$8.02	\$0.00	\$84.00
4	80.00	\$54.36	\$12.84	\$15.57	\$8.02	\$0.00	\$90.79
5	90.00	\$61.16	\$12.84	\$15.57	\$8.02	\$0.00	\$97.59
Apprentice: BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)							
Effective Date: 8/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	\$35.08	\$12.84	\$15.57	\$8.02	\$0.00	\$71.51
2	60.00	\$42.09	\$12.84	\$15.57	\$8.02	\$0.00	\$78.52
3	70.00	\$49.11	\$12.84	\$15.57	\$8.02	\$0.00	\$85.54
4	80.00	\$56.12	\$12.84	\$15.57	\$8.02	\$0.00	\$92.55
5	90.00	\$63.14	\$12.84	\$15.57	\$8.02	\$0.00	\$99.57
Apprentice to Journeyworker Ratio: 1:5							
BULLDOZER/GRADER/SCRAPER OPERATING ENGINEERS LOCAL 4	12/1/2025	\$58.62	\$16.05	\$13.25	\$3.25	\$0.00	\$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	\$59.90	\$16.05	\$13.25	\$3.25	\$0.00	\$92.45
OPERATING ENGINEERS LOCAL 4	12/1/2026	\$61.34	\$16.05	\$13.25	\$3.25	\$0.00	\$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
CAISSON & UNDERPINNING BOTTOM MAN LABORERS	12/1/2025	\$49.10	\$10.65	\$9.75	\$9.80	\$0.00	\$79.30
LABORERS - FOUNDATION AND MARINE	6/1/2026	\$50.65	\$10.65	\$9.75	\$9.80	\$0.00	\$80.85
LABORERS	12/1/2026	\$52.15	\$10.65	\$9.75	\$9.80	\$0.00	\$82.35
For apprentice rates see "Apprentice- LABORER"							
CAISSON & UNDERPINNING LABORER LABORERS	12/1/2025	\$47.95	\$10.65	\$9.75	\$9.80	\$0.00	\$78.15
LABORERS	6/1/2026	\$49.50	\$10.65	\$9.75	\$9.80	\$0.00	\$79.70

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
LABORERS - FOUNDATION AND MARINE	12/1/2026	\$51.00	\$10.65	\$9.75	\$9.80	\$0.00	\$81.20
For apprentice rates see "Apprentice- LABORER"							

CAISSON & UNDERPINNING TOP MAN LABORERS	12/1/2025	\$48.28	\$10.65	\$9.75	\$9.80	\$0.00	\$78.48
LABORERS - FOUNDATION AND MARINE	6/1/2026	\$49.83	\$10.65	\$9.75	\$9.80	\$0.00	\$80.03
LABORERS - FOUNDATION AND MARINE	12/1/2026	\$51.33	\$10.65	\$9.75	\$9.80	\$0.00	\$81.53
For apprentice rates see "Apprentice- LABORER"							

CARBIDE CORE DRILL OPERATOR LABORERS	12/1/2025	\$48.10	\$10.65	\$9.75	\$9.65	\$0.00	\$78.15
LABORERS	6/1/2026	\$49.65	\$10.65	\$9.75	\$9.65	\$0.00	\$79.70
LABORERS - ZONE 1	12/1/2026	\$51.15	\$10.65	\$9.75	\$9.65	\$0.00	\$81.20
	6/1/2027	\$52.75	\$10.65	\$9.75	\$9.65	\$0.00	\$82.80
	12/1/2027	\$54.35	\$10.65	\$9.75	\$9.65	\$0.00	\$84.40
	6/1/2028	\$56.03	\$10.65	\$9.75	\$9.65	\$0.00	\$86.08
	12/1/2028	\$57.70	\$10.65	\$9.75	\$9.65	\$0.00	\$87.75
For apprentice rates see "Apprentice- LABORER"							

CARPENTER	3/1/2026	\$62.69	\$10.58	\$11.47	\$8.50	\$0.00	\$93.24
CARPENTERS	9/1/2026	\$64.19	\$10.58	\$11.47	\$8.50	\$0.00	\$94.74
CARPENTERS -ZONE 1 (Metro Boston)	3/1/2027	\$65.69	\$10.58	\$11.47	\$8.50	\$0.00	\$96.24

Apprentice: CARPENTER							
Effective Date: 3/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	\$28.21	\$10.58	\$0.00	\$1.73	\$0.00	\$40.52
2	45.00	\$28.21	\$10.58	\$0.00	\$1.73	\$0.00	\$40.52
3	55.00	\$34.48	\$10.58	\$0.00	\$3.40	\$0.00	\$48.46
4	55.00	\$34.48	\$10.58	\$0.00	\$3.40	\$0.00	\$48.46
5	70.00	\$43.88	\$10.58	\$11.41	\$5.10	\$0.00	\$70.97
6	70.00	\$43.88	\$10.58	\$11.41	\$5.10	\$0.00	\$70.97
7	80.00	\$50.15	\$10.58	\$11.44	\$6.80	\$0.00	\$78.97
8	80.00	\$50.15	\$10.58	\$11.44	\$6.80	\$0.00	\$78.97

Apprentice: CARPENTER							
Effective Date: 9/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	\$28.89	\$10.58	\$0.00	\$1.73	\$0.00	\$41.20
2	45.00	\$28.89	\$10.58	\$0.00	\$1.73	\$0.00	\$41.20
3	55.00	\$35.30	\$10.58	\$0.00	\$3.40	\$0.00	\$49.28
4	55.00	\$35.30	\$10.58	\$0.00	\$3.40	\$0.00	\$49.28
5	70.00	\$44.93	\$10.58	\$11.41	\$5.10	\$0.00	\$72.02
6	70.00	\$44.93	\$10.58	\$11.41	\$5.10	\$0.00	\$72.02
7	80.00	\$51.35	\$10.58	\$11.44	\$6.80	\$0.00	\$80.17
8	80.00	\$51.35	\$10.58	\$11.44	\$6.80	\$0.00	\$80.17

Apprentice to Journeyworker Ratio: 1:5

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
CARPENTER WOOD FRAME	10/1/2025	\$38.79	\$8.09	\$4.47	\$5.00	\$0.00	\$56.35
CARPENTERS	4/1/2026	\$39.59	\$8.09	\$4.47	\$5.00	\$0.00	\$57.15
CARPENTERS -ZONE 1 (Wood Frame)	10/1/2026	\$40.39	\$8.09	\$4.47	\$5.00	\$0.00	\$57.95
	4/1/2027	\$41.19	\$8.09	\$4.47	\$5.00	\$0.00	\$58.75

All Aspects of New Wood Frame Work

Apprentice: CARPENTER WOOD FRAME							
Effective Date: 10/1/2025							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	\$19.40	\$8.09	\$0.00	\$0.00	\$0.00	\$27.49
2	50.00	\$19.40	\$8.09	\$0.00	\$0.00	\$0.00	\$27.49
3	55.00	\$21.33	\$8.09	\$0.00	\$2.00	\$0.00	\$31.42
4	55.00	\$21.33	\$8.09	\$0.00	\$2.00	\$0.00	\$31.42
5	70.00	\$27.15	\$8.09	\$4.47	\$3.00	\$0.00	\$42.71
6	70.00	\$27.15	\$8.09	\$4.47	\$3.00	\$0.00	\$42.71
7	80.00	\$31.03	\$8.09	\$4.47	\$4.00	\$0.00	\$47.59
8	80.00	\$31.03	\$8.09	\$4.47	\$4.00	\$0.00	\$47.59

Apprentice: CARPENTER WOOD FRAME							
Effective Date: 4/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	\$19.80	\$8.09	\$0.00	\$0.00	\$0.00	\$27.89
2	50.00	\$19.80	\$8.09	\$0.00	\$0.00	\$0.00	\$27.89
3	55.00	\$21.77	\$8.09	\$0.00	\$2.00	\$0.00	\$31.86
4	55.00	\$21.77	\$8.09	\$0.00	\$2.00	\$0.00	\$31.86
5	70.00	\$27.71	\$8.09	\$4.47	\$3.00	\$0.00	\$43.27
6	70.00	\$27.71	\$8.09	\$4.47	\$3.00	\$0.00	\$43.27
7	80.00	\$31.67	\$8.09	\$4.47	\$4.00	\$0.00	\$48.23
8	80.00	\$31.67	\$8.09	\$4.47	\$4.00	\$0.00	\$48.23

Apprentice to Journeyworker Ratio: 1:5

CEMENT MASONRY/PLASTERING	1/1/2026	\$53.24	\$13.35	\$16.43	\$7.78	\$1.80	\$92.60
PLASTERERS AND CEMENT MASONS LOCAL 534	7/1/2026	\$54.49	\$13.35	\$16.43	\$7.78	\$1.80	\$93.85
Plasterers and Cement Masons - Zone 1	1/1/2027	\$55.94	\$13.35	\$16.43	\$7.78	\$1.80	\$95.30
	7/1/2027	\$57.29	\$13.35	\$16.43	\$7.78	\$1.80	\$96.65
	1/1/2028	\$58.64	\$13.35	\$16.43	\$7.78	\$1.80	\$98.00

Apprentice: CEMENT MASONRY/PLASTERING							
Effective Date: 1/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	\$26.62	\$13.35	\$16.43	\$0.00	\$0.00	\$56.40
2	60.00	\$31.94	\$13.35	\$16.43	\$7.78	\$1.80	\$71.30

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice: CEMENT MASONRY/PLASTERING							
Effective Date: 1/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
3	65.00	\$34.61	\$13.35	\$16.43	\$7.78	\$1.80	\$73.97
4	70.00	\$37.27	\$13.35	\$16.43	\$7.78	\$1.80	\$76.63
5	75.00	\$39.93	\$13.35	\$16.43	\$7.78	\$1.80	\$79.29
6	80.00	\$42.59	\$13.35	\$16.43	\$7.78	\$1.80	\$81.95
7	90.00	\$47.92	\$13.35	\$16.43	\$0.00	\$0.00	\$77.70
Apprentice: CEMENT MASONRY/PLASTERING							
Effective Date: 7/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	\$27.25	\$13.35	\$16.43	\$0.00	\$0.00	\$57.03
2	60.00	\$32.69	\$13.35	\$16.43	\$7.78	\$1.80	\$72.05
3	65.00	\$35.42	\$13.35	\$16.43	\$7.78	\$1.80	\$74.78
4	70.00	\$38.14	\$13.35	\$16.43	\$7.78	\$1.80	\$77.50
5	75.00	\$40.87	\$13.35	\$16.43	\$7.78	\$1.80	\$80.23
6	80.00	\$43.59	\$13.35	\$16.43	\$7.78	\$1.80	\$82.95
7	90.00	\$49.04	\$13.35	\$0.00	\$7.78	\$0.00	\$70.17
Apprentice to Journeyworker Ratio: 1:5							
CHAIN SAW OPERATOR	12/1/2025	\$48.10	\$10.65	\$9.75	\$9.65	\$0.00	\$78.15
LABORERS	6/1/2026	\$49.65	\$10.65	\$9.75	\$9.65	\$0.00	\$79.70
LABORERS - ZONE 1	12/1/2026	\$51.15	\$10.65	\$9.75	\$9.65	\$0.00	\$81.20
	6/1/2027	\$52.75	\$10.65	\$9.75	\$9.65	\$0.00	\$82.80
	12/1/2027	\$54.35	\$10.65	\$9.75	\$9.65	\$0.00	\$84.40
	6/1/2028	\$56.03	\$10.65	\$9.75	\$9.65	\$0.00	\$86.08
	12/1/2028	\$57.70	\$10.65	\$9.75	\$9.65	\$0.00	\$87.75
For apprentice rates see "Apprentice- LABORER"							
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES	12/1/2025	\$60.48	\$16.05	\$13.25	\$3.25	\$0.00	\$93.03
OPERATING ENGINEERS LOCAL 4	6/1/2026	\$61.81	\$16.05	\$13.25	\$3.25	\$0.00	\$94.36
OPERATING ENGINEERS LOCAL 4	12/1/2026	\$63.29	\$16.05	\$13.25	\$3.25	\$0.00	\$95.84
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
COMPRESSOR OPERATOR	12/1/2025	\$37.97	\$16.05	\$13.25	\$3.25	\$0.00	\$70.52
OPERATING ENGINEERS LOCAL 4	6/1/2026	\$38.83	\$16.05	\$13.25	\$3.25	\$0.00	\$71.38
OPERATING ENGINEERS LOCAL 4	12/1/2026	\$39.78	\$16.05	\$13.25	\$3.25	\$0.00	\$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
DELEADER (BRIDGE)	1/1/2026	\$59.56	\$10.35	\$12.00	\$12.60	\$0.00	\$94.51
PAINTERS LOCAL 35							
PAINTERS LOCAL 35 - ZONE 1							

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice: DELEADER (BRIDGE)							
Effective Date: 1/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	\$29.78	\$10.35	\$0.00	\$0.00	\$0.00	\$40.13
2	55.00	\$32.76	\$10.35	\$0.00	\$6.93	\$0.00	\$50.04
3	60.00	\$35.74	\$10.35	\$0.00	\$7.56	\$0.00	\$53.65
4	65.00	\$38.71	\$10.35	\$0.00	\$8.19	\$0.00	\$57.25
5	70.00	\$41.69	\$10.35	\$12.00	\$8.82	\$0.00	\$72.86
6	75.00	\$44.67	\$10.35	\$12.00	\$9.45	\$0.00	\$76.47
7	80.00	\$47.65	\$10.35	\$12.00	\$10.08	\$0.00	\$80.08
8	90.00	\$53.60	\$10.35	\$12.00	\$11.34	\$0.00	\$87.29

Apprentice to Journeyworker Ratio: 1:1

DEMO: ADZEMAN LABORERS	12/1/2025	\$48.00	\$10.65	\$9.75	\$9.65	\$0.00	\$78.05
LABORERS - ZONE 1	6/1/2026	\$49.55	\$10.65	\$9.75	\$9.65	\$0.00	\$79.60
	12/7/2026	\$51.05	\$10.65	\$9.75	\$9.65	\$0.00	\$81.10
	6/7/2027	\$52.65	\$10.65	\$9.75	\$9.65	\$0.00	\$82.70
	12/6/2027	\$54.25	\$10.65	\$9.75	\$9.65	\$0.00	\$84.30
	6/5/2028	\$55.93	\$10.65	\$9.75	\$9.65	\$0.00	\$85.98
	12/4/2028	\$57.60	\$10.65	\$9.75	\$9.65	\$0.00	\$87.65

For apprentice rates see "Apprentice- LABORER"

DEMO: BACKHOE/LOADER/HAMMER OPERATOR LABORERS	12/1/2025	\$49.00	\$10.65	\$9.75	\$9.65	\$0.00	\$79.05
LABORERS - ZONE 1	6/1/2026	\$50.55	\$10.65	\$9.75	\$9.65	\$0.00	\$80.60
	12/7/2026	\$52.05	\$10.65	\$9.75	\$9.65	\$0.00	\$82.10
	6/7/2027	\$53.65	\$10.65	\$9.75	\$9.65	\$0.00	\$83.70
	12/6/2027	\$55.25	\$10.65	\$9.75	\$9.65	\$0.00	\$85.30
	6/5/2028	\$56.93	\$10.65	\$9.75	\$9.65	\$0.00	\$86.98
	12/4/2028	\$58.60	\$10.65	\$9.75	\$9.65	\$0.00	\$88.65

For apprentice rates see "Apprentice- LABORER"

DEMO: BURNERS LABORERS	12/1/2025	\$48.75	\$10.65	\$9.75	\$9.65	\$0.00	\$78.80
LABORERS - ZONE 1	6/1/2026	\$50.30	\$10.65	\$9.75	\$9.65	\$0.00	\$80.35
	12/7/2026	\$51.80	\$10.65	\$9.75	\$9.65	\$0.00	\$81.85
	6/7/2027	\$53.40	\$10.65	\$9.75	\$9.65	\$0.00	\$83.45
	12/6/2027	\$55.00	\$10.65	\$9.75	\$9.65	\$0.00	\$85.05
	6/5/2028	\$56.68	\$10.65	\$9.75	\$9.65	\$0.00	\$86.73
	12/4/2028	\$58.35	\$10.65	\$9.75	\$9.65	\$0.00	\$88.40

For apprentice rates see "Apprentice- LABORER"

DEMO: CONCRETE CUTTER/SAWYER LABORERS	12/1/2025	\$49.00	\$10.65	\$9.75	\$9.65	\$0.00	\$79.05
LABORERS - ZONE 1	6/1/2026	\$50.55	\$10.65	\$9.75	\$9.65	\$0.00	\$80.60
	12/7/2026	\$52.05	\$10.65	\$9.75	\$9.65	\$0.00	\$82.10
	6/7/2027	\$53.65	\$10.65	\$9.75	\$9.65	\$0.00	\$83.70
	12/6/2027	\$55.25	\$10.65	\$9.75	\$9.65	\$0.00	\$85.30
	6/5/2028	\$56.93	\$10.65	\$9.75	\$9.65	\$0.00	\$86.98
	12/4/2028	\$58.60	\$10.65	\$9.75	\$9.65	\$0.00	\$88.65

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"							
DEMO: JACKHAMMER OPERATOR	12/1/2025	\$48.75	\$10.65	\$9.75	\$9.65	\$0.00	\$78.80
LABORERS	6/1/2026	\$50.30	\$10.65	\$9.75	\$9.65	\$0.00	\$80.35
LABORERS - ZONE 1	12/7/2026	\$51.80	\$10.65	\$9.75	\$9.65	\$0.00	\$81.85
	6/7/2027	\$53.40	\$10.65	\$9.75	\$9.65	\$0.00	\$83.45
	12/6/2027	\$55.00	\$10.65	\$9.75	\$9.65	\$0.00	\$85.05
	6/5/2028	\$56.68	\$10.65	\$9.75	\$9.65	\$0.00	\$86.73
	12/4/2028	\$58.35	\$10.65	\$9.75	\$9.65	\$0.00	\$88.40
For apprentice rates see "Apprentice- LABORER"							
DEMO: WRECKING LABORER	12/1/2025	\$48.00	\$10.65	\$9.75	\$9.65	\$0.00	\$78.05
LABORERS	6/1/2026	\$49.55	\$10.65	\$9.75	\$9.65	\$0.00	\$79.60
LABORERS - ZONE 1	12/7/2026	\$51.05	\$10.65	\$9.75	\$9.65	\$0.00	\$81.10
	6/7/2027	\$52.65	\$10.65	\$9.75	\$9.65	\$0.00	\$82.70
	12/6/2027	\$54.25	\$10.65	\$9.75	\$9.65	\$0.00	\$84.30
	6/5/2028	\$55.93	\$10.65	\$9.75	\$9.65	\$0.00	\$85.98
	12/4/2028	\$57.60	\$10.65	\$9.75	\$9.65	\$0.00	\$87.65
For apprentice rates see "Apprentice- LABORER"							
DIRECTIONAL DRILL MACHINE OPERATOR	12/1/2025	\$58.62	\$16.05	\$13.25	\$3.25	\$0.00	\$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	\$59.90	\$16.05	\$13.25	\$3.25	\$0.00	\$92.45
OPERATING ENGINEERS LOCAL 4	12/1/2026	\$61.34	\$16.05	\$13.25	\$3.25	\$0.00	\$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
DIVER	8/1/2024	\$78.11	\$10.08	\$11.62	\$10.04	\$0.00	\$109.85
PILE DRIVER LOCAL 56							
PILE DRIVER LOCAL 56 (ZONE 1)							
as of 8-1-24, Apprentices with diving licenses begin at second year. % of Diver wage 70/80/90 2A \$69.83, 3A \$91.79,4A \$102.14 Total Rate							
DIVER TENDER	8/1/2024	\$55.79	\$10.08	\$11.62	\$12.67	\$0.00	\$90.16
PILE DRIVER LOCAL 56							
PILE DRIVER LOCAL 56 (ZONE 1)							
as of 8-1-24, Apprentices with diving licenses begin at second year. % of Piledriver wage 70/80/90 2A \$54.20, 3A \$73.93,4A \$82.05 Total Rate							
DIVER TENDER (EFFLUENT)	8/1/2024	\$83.69	\$10.08	\$11.62	\$12.67	\$0.00	\$118.06
PILE DRIVER LOCAL 56							
PILE DRIVER LOCAL 56 (ZONE 1)							
For apprentice rates see "Apprentice- PILE DRIVER"							
DIVER/SLURRY (EFFLUENT)	8/1/2024	\$117.16	\$10.08	\$11.62	\$12.67	\$0.00	\$151.53
PILE DRIVER LOCAL 56							
PILE DRIVER LOCAL 56 (ZONE 1)							
For apprentice rates see "Apprentice- PILE DRIVER"							
DRAWBRIDGE OPERATOR (Construction)	7/1/2020	\$26.77	\$6.67	\$3.93	\$0.00	\$0.16	\$37.53
DRAWBRIDGE - SEIU LOCAL 888							
DRAWBRIDGE - SEIU LOCAL 888							
ELECTRICIAN	3/1/2026	\$66.86	\$13.00	\$14.64	\$9.00	\$0.00	\$103.50
ELECTRICIANS LOCAL 103	9/1/2026	\$68.78	\$13.00	\$14.69	\$9.00	\$0.00	\$105.47
ELECTRICIANS LOCAL 103	3/1/2027	\$69.97	\$13.00	\$14.73	\$9.00	\$0.00	\$106.70

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
	9/1/2027	\$71.88	\$13.00	\$14.79	\$9.00	\$0.00	\$108.67
	3/1/2028	\$73.08	\$13.00	\$14.82	\$9.00	\$0.00	\$109.90

Apprentice: ELECTRICIAN							
Effective Date: 3/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	40.00	\$26.74	\$13.00	\$0.80	\$0.00	\$0.00	\$40.54
2	40.00	\$26.74	\$13.00	\$0.80	\$0.00	\$0.00	\$40.54
3	45.00	\$30.09	\$13.00	\$13.53	\$4.05	\$0.00	\$60.67
4	45.00	\$30.09	\$13.00	\$13.53	\$4.05	\$0.00	\$60.67
5	50.00	\$33.43	\$13.00	\$13.63	\$4.50	\$0.00	\$64.56
6	55.00	\$36.77	\$13.00	\$13.73	\$4.95	\$0.00	\$68.45
7	60.00	\$40.12	\$13.00	\$13.83	\$5.40	\$0.00	\$72.35
8	65.00	\$43.46	\$13.00	\$13.93	\$5.85	\$0.00	\$76.24
9	70.00	\$46.80	\$13.00	\$14.03	\$6.30	\$0.00	\$80.13
10	75.00	\$50.15	\$13.00	\$14.13	\$6.75	\$0.00	\$84.03

Apprentice: ELECTRICIAN							
Effective Date: 9/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	40.00	\$27.51	\$13.00	\$0.83	\$0.00	\$0.00	\$41.34
2	40.00	\$27.51	\$13.00	\$0.83	\$0.00	\$0.00	\$41.34
3	45.00	\$30.95	\$13.00	\$13.56	\$4.05	\$0.00	\$61.56
4	45.00	\$30.95	\$13.00	\$13.56	\$4.05	\$0.00	\$61.56
5	50.00	\$34.39	\$13.00	\$13.66	\$4.50	\$0.00	\$65.55
6	55.00	\$37.83	\$13.00	\$13.76	\$4.95	\$0.00	\$69.54
7	60.00	\$41.27	\$13.00	\$13.87	\$5.40	\$0.00	\$73.54
8	65.00	\$44.71	\$13.00	\$13.97	\$5.85	\$0.00	\$77.53
9	70.00	\$48.15	\$13.00	\$14.07	\$6.30	\$0.00	\$81.52
10	75.00	\$51.59	\$13.00	\$14.18	\$6.75	\$0.00	\$85.52

Apprentice Notes
:

Apprentice to Journeyworker Ratio: 2:3

ELEVATOR CONSTRUCTOR	1/1/2026	\$77.26	\$16.38	\$11.06	\$10.70	\$0.00	\$115.40
ELEVATOR CONSTRUCTORS LOCAL 4	1/1/2027	\$80.55	\$16.48	\$11.16	\$11.00	\$0.00	\$119.19
ELEVATOR CONSTRUCTORS LOCAL 4							

Apprentice: ELEVATOR CONSTRUCTOR							
Effective Date: 1/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice: ELEVATOR CONSTRUCTOR							
Effective Date: 1/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	\$38.63	\$0.00	\$0.00	\$0.00	\$0.00	\$38.63
2	55.00	\$42.49	\$16.38	\$11.06	\$10.70	\$0.00	\$80.63
3	65.00	\$50.22	\$16.38	\$11.06	\$10.70	\$0.00	\$88.36
4	70.00	\$54.08	\$16.38	\$11.06	\$10.70	\$0.00	\$92.22
5	80.00	\$61.81	\$16.38	\$11.06	\$10.70	\$0.00	\$99.95
Apprentice: ELEVATOR CONSTRUCTOR							
Effective Date: 1/1/2027							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	\$40.28	\$0.00	\$0.00	\$0.00	\$0.00	\$40.28
2	55.00	\$44.30	\$16.48	\$11.16	\$11.00	\$0.00	\$82.94
3	65.00	\$52.36	\$16.48	\$11.16	\$11.00	\$0.00	\$91.00
4	70.00	\$56.39	\$16.48	\$11.16	\$11.00	\$0.00	\$95.03
5	80.00	\$64.44	\$16.48	\$11.16	\$11.00	\$0.00	\$103.08
Apprentice to Journeyworker Ratio: 1:1							
ELEVATOR CONSTRUCTOR HELPER	1/1/2026	\$54.08	\$16.38	\$11.06	\$10.07	\$0.00	\$91.59
ELEVATOR CONSTRUCTORS LOCAL 4	1/1/2027	\$56.39	\$16.48	\$11.16	\$11.00	\$0.00	\$95.03
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"							
FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY)	12/1/2025	\$48.20	\$10.65	\$9.75	\$9.65	\$0.00	\$78.25
LABORERS	6/1/2026	\$49.75	\$10.65	\$9.75	\$9.65	\$0.00	\$79.80
LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2026	\$51.25	\$10.65	\$9.75	\$9.65	\$0.00	\$81.30
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY	11/1/2025	\$53.56	\$16.05	\$13.25	\$3.25	\$0.00	\$86.11
OPERATING ENGINEERS LOCAL 4	5/1/2026	\$55.00	\$16.05	\$13.25	\$3.25	\$0.00	\$87.55
OPERATING ENGINEERS LOCAL 4	11/1/2026	\$56.29	\$16.05	\$13.25	\$3.25	\$0.00	\$88.84
	5/1/2027	\$57.72	\$16.05	\$13.25	\$3.25	\$0.00	\$90.27
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY	11/1/2025	\$55.17	\$16.05	\$13.25	\$3.25	\$0.00	\$87.72
OPERATING ENGINEERS LOCAL 4	5/1/2026	\$56.62	\$16.05	\$13.25	\$3.25	\$0.00	\$89.17
OPERATING ENGINEERS LOCAL 4	11/1/2026	\$57.92	\$16.05	\$13.25	\$3.25	\$0.00	\$90.47
	5/1/2027	\$59.37	\$16.05	\$13.25	\$3.25	\$0.00	\$91.92
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY	11/1/2025	\$26.03	\$16.05	\$13.25	\$3.25	\$0.00	\$58.58
OPERATING ENGINEERS LOCAL 4	5/1/2026	\$26.88	\$16.05	\$13.25	\$3.25	\$0.00	\$59.43
OPERATING ENGINEERS LOCAL 4	11/1/2026	\$27.64	\$16.05	\$13.25	\$3.25	\$0.00	\$60.19
	5/1/2027	\$28.49	\$16.05	\$13.25	\$3.25	\$0.00	\$61.04

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
FIRE ALARM INSTALLER	3/1/2026	\$66.86	\$13.00	\$14.64	\$9.00	\$0.00	\$103.50
ELECTRICIANS LOCAL 103	9/1/2026	\$68.78	\$13.00	\$14.69	\$9.00	\$0.00	\$105.47
ELECTRICIANS LOCAL 103	3/1/2027	\$69.97	\$13.00	\$14.73	\$9.00	\$0.00	\$106.70
	9/1/2027	\$71.88	\$13.00	\$14.79	\$9.00	\$0.00	\$108.67
	3/1/2028	\$73.08	\$13.00	\$14.82	\$9.00	\$0.00	\$109.90
For apprentice rates see "Apprentice- ELECTRICIAN"							
FIRE ALARM REPAIR / MAINTENANCE	3/1/2026	\$53.49	\$13.00	\$14.23	\$7.20	\$0.00	\$87.92
/ COMMISSIONING	9/1/2026	\$55.02	\$13.00	\$14.28	\$7.20	\$0.00	\$89.50
ELECTRICIANS LOCAL 103	3/1/2027	\$55.98	\$13.00	\$14.31	\$7.20	\$0.00	\$90.49
ELECTRICIANS LOCAL 103	9/1/2027	\$57.50	\$13.00	\$14.36	\$7.20	\$0.00	\$92.06
	3/1/2028	\$58.46	\$13.00	\$14.38	\$7.20	\$0.00	\$93.04
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"							
FIREMAN (ASST. ENGINEER)	12/1/2025	\$47.69	\$16.05	\$13.25	\$3.25	\$0.00	\$80.24
OPERATING ENGINEERS LOCAL 4	6/1/2026	\$48.75	\$16.05	\$13.25	\$3.25	\$0.00	\$81.30
OPERATING ENGINEERS LOCAL 4	12/1/2026	\$49.93	\$16.05	\$13.25	\$3.25	\$0.00	\$82.48
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
FLAGGER & SIGNALER (HEAVY & HIGHWAY)	12/1/2025	\$28.09	\$10.65	\$9.75	\$9.65	\$0.00	\$58.14
LABORERS	6/1/2026	\$29.21	\$10.65	\$9.75	\$9.65	\$0.00	\$59.26
LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2026	\$29.21	\$10.65	\$9.75	\$9.65	\$0.00	\$59.26
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
FLOORCOVERER	3/1/2026	\$59.24	\$10.33	\$11.47	\$8.80	\$0.00	\$89.84
FLOORCOVERERS LOCAL 2168	9/1/2026	\$60.74	\$10.33	\$11.47	\$8.80	\$0.00	\$91.34
FLOORCOVERERS LOCAL 2168 ZONE I	3/1/2027	\$62.24	\$10.33	\$11.47	\$8.80	\$0.00	\$92.84

Apprentice: FLOORCOVERER							
Effective Date: 3/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	\$26.66	\$10.33	\$0.00	\$1.76	\$0.00	\$38.75
2	45.00	\$26.66	\$10.33	\$0.00	\$1.76	\$0.00	\$38.75
3	55.00	\$32.58	\$10.33	\$0.00	\$3.52	\$0.00	\$46.43
4	55.00	\$32.58	\$10.33	\$0.00	\$3.52	\$0.00	\$46.43
5	70.00	\$41.47	\$10.33	\$11.47	\$5.28	\$0.00	\$68.55
6	70.00	\$41.47	\$10.33	\$11.47	\$5.28	\$0.00	\$68.55
7	80.00	\$47.39	\$10.33	\$11.47	\$7.04	\$0.00	\$76.23
8	80.00	\$47.39	\$10.33	\$11.47	\$7.04	\$0.00	\$76.23

Apprentice: FLOORCOVERER							
Effective Date: 9/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
OPERATING ENGINEERS LOCAL 4	6/1/2026	\$60.58	\$16.05	\$13.25	\$3.25	\$0.00	\$93.13
OPERATING ENGINEERS LOCAL 4	12/1/2026	\$62.03	\$16.05	\$13.25	\$3.25	\$0.00	\$94.58

Apprentice: HOISTING ENGINEER/CRANES/GRADALLS							
Effective Date: 12/1/2025							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	55.00	\$32.88	\$0.00	\$0.00	\$0.00	\$0.00	\$32.88
2	60.00	\$35.87	\$16.05	\$13.25	\$3.25	\$0.00	\$68.42
3	65.00	\$38.86	\$16.05	\$13.25	\$3.25	\$0.00	\$71.41
4	70.00	\$41.85	\$16.05	\$13.25	\$3.25	\$0.00	\$74.40
5	75.00	\$44.84	\$16.05	\$13.25	\$3.25	\$0.00	\$77.39
6	80.00	\$47.82	\$16.05	\$13.25	\$3.25	\$0.00	\$80.37
7	85.00	\$50.81	\$16.05	\$13.25	\$3.25	\$0.00	\$83.36
8	90.00	\$53.80	\$16.05	\$13.25	\$3.25	\$0.00	\$86.35

Apprentice: HOISTING ENGINEER/CRANES/GRADALLS							
Effective Date: 6/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	55.00	\$33.32	\$0.00	\$0.00	\$0.00	\$0.00	\$33.32
2	60.00	\$36.35	\$16.05	\$13.25	\$3.25	\$0.00	\$68.90
3	65.00	\$39.38	\$16.05	\$13.25	\$3.25	\$0.00	\$71.93
4	70.00	\$42.41	\$16.50	\$13.25	\$3.25	\$0.00	\$75.41
5	75.00	\$45.44	\$16.50	\$13.25	\$3.25	\$0.00	\$78.44
6	80.00	\$48.46	\$16.50	\$13.25	\$3.25	\$0.00	\$81.46
7	85.00	\$51.49	\$16.50	\$13.25	\$3.25	\$0.00	\$84.49
8	90.00	\$54.52	\$16.50	\$13.25	\$3.25	\$0.00	\$87.52

Apprentice to Journeyworker Ratio: 1:6

HVAC (DUCTWORK)	2/1/2026	\$62.93	\$14.91	\$18.74	\$9.53	\$2.98	\$109.09
SHEETMETAL WORKERS LOCAL 17							
SHEETMETAL WORKERS LOCAL 17 - A							

For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (ELECTRICAL CONTROLS)	3/1/2026	\$66.86	\$13.00	\$14.64	\$9.00	\$0.00	\$103.50
ELECTRICIANS LOCAL 103	9/1/2026	\$68.78	\$13.00	\$14.69	\$9.00	\$0.00	\$105.47
ELECTRICIANS LOCAL 103	3/1/2027	\$69.97	\$13.00	\$14.73	\$9.00	\$0.00	\$106.70
	9/1/2027	\$71.88	\$13.00	\$14.79	\$9.00	\$0.00	\$108.67
	3/1/2028	\$73.08	\$13.00	\$14.82	\$9.00	\$0.00	\$109.90

For apprentice rates see "Apprentice- ELECTRICIAN"

HVAC (TESTING AND BALANCING - AIR)	2/1/2026	\$62.93	\$14.91	\$18.74	\$9.53	\$2.98	\$109.09
SHEETMETAL WORKERS LOCAL 17							
SHEETMETAL WORKERS LOCAL 17 - A							

For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (TESTING AND BALANCING -WATER)	3/1/2026	\$70.58	\$13.95	\$14.00	\$9.55	\$0.00	\$108.08
-------------------------------------	----------	---------	---------	---------	--------	--------	----------

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
PIPEFITTERS LOCAL 537 PIPEFITTERS LOCAL 537							
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"							
HVAC MECHANIC PIPEFITTERS LOCAL 537 PIPEFITTERS LOCAL 537	3/1/2026	\$70.58	\$13.95	\$14.00	\$9.55	\$0.00	\$108.08
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"							
HYDRAULIC DRILLS LABORERS LABORERS - ZONE 1	12/1/2025	\$48.60	\$10.65	\$9.75	\$9.65	\$0.00	\$78.65
	6/1/2026	\$49.40	\$10.65	\$9.75	\$9.65	\$0.00	\$79.45
	12/1/2026	\$51.65	\$10.65	\$9.75	\$9.65	\$0.00	\$81.70
	6/1/2027	\$53.25	\$10.65	\$9.75	\$9.65	\$0.00	\$83.30
	12/1/2027	\$54.85	\$10.65	\$9.75	\$9.65	\$0.00	\$84.90
	6/1/2028	\$56.53	\$10.65	\$9.75	\$9.65	\$0.00	\$86.58
	12/1/2028	\$58.20	\$10.65	\$9.75	\$9.65	\$0.00	\$88.25
For apprentice rates see "Apprentice- LABORER"							
HYDRAULIC DRILLS (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2025	\$48.70	\$10.65	\$9.75	\$9.65	\$0.00	\$78.75
	6/1/2026	\$50.25	\$10.65	\$9.75	\$9.65	\$0.00	\$80.30
	12/1/2026	\$51.75	\$10.65	\$9.75	\$9.65	\$0.00	\$81.80
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
INSULATOR (PIPES & TANKS) HEAT & FROST INSULATORS LOCAL 6 HEAT & FROST INSULATORS LOCAL 6 (BOSTON)	9/1/2025	\$60.34	\$14.75	\$9.52	\$10.09	\$0.00	\$94.70
	9/1/2026	\$63.76	\$14.75	\$9.52	\$10.09	\$0.00	\$98.12

Apprentice: INSULATOR (PIPES & TANKS)							
Effective Date: 9/1/2025							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	\$30.17	\$14.75	\$9.27	\$5.05	\$0.00	\$59.24
2	60.00	\$36.20	\$14.75	\$9.32	\$6.05	\$0.00	\$66.32
3	70.00	\$42.24	\$14.75	\$9.37	\$7.06	\$0.00	\$73.42
4	80.00	\$48.27	\$14.75	\$9.42	\$8.07	\$0.00	\$80.51

Apprentice: INSULATOR (PIPES & TANKS)							
Effective Date: 9/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	\$31.88	\$14.75	\$9.27	\$5.05	\$0.00	\$60.95
2	60.00	\$38.26	\$14.75	\$9.32	\$6.05	\$0.00	\$68.38
3	70.00	\$44.63	\$14.75	\$9.37	\$7.06	\$0.00	\$75.81
4	80.00	\$51.01	\$14.75	\$9.42	\$8.07	\$0.00	\$83.25

Apprentice to Journeyworker Ratio: 1:4

IRONWORKER/WELDER IRONWORKERS LOCAL 7	9/16/2025	\$57.87	\$9.05	\$12.75	\$14.50	\$0.00	\$94.17
--	-----------	---------	--------	---------	---------	--------	---------

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
----------------	----------------	-----------	--------	---------	---------	---------------------------	------------

IRONWORKERS LOCAL 7 (BOSTON AREA)

Apprentice: IRONWORKER/WELDER							
Effective Date: 9/16/2025							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	\$34.72	\$9.05	\$12.75	\$4.50	\$0.00	\$61.02
2	75.00	\$43.40	\$9.05	\$12.75	\$4.50	\$0.00	\$69.70
3	85.00	\$49.19	\$9.05	\$12.75	\$4.50	\$0.00	\$75.49
4	0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
5	0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
6	0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

Apprentice to Journeyworker Ratio: 1:4

JACKHAMMER & PAVING BREAKER OPERATOR	12/1/2025	\$48.10	\$10.65	\$9.75	\$9.65	\$0.00	\$78.15
LABORERS	6/1/2026	\$49.65	\$10.65	\$9.75	\$9.65	\$0.00	\$79.70
LABORERS - ZONE 1	12/1/2026	\$51.15	\$10.65	\$9.75	\$9.65	\$0.00	\$81.20
	6/1/2027	\$52.75	\$10.65	\$9.75	\$9.65	\$0.00	\$82.80
	12/1/2027	\$54.35	\$10.65	\$9.75	\$9.65	\$0.00	\$84.40
	6/1/2028	\$56.03	\$10.65	\$9.75	\$9.65	\$0.00	\$86.08
	12/1/2028	\$57.70	\$10.65	\$9.75	\$9.65	\$0.00	\$87.75

For apprentice rates see "Apprentice- LABORER"

LABORER	12/1/2025	\$47.85	\$10.65	\$9.75	\$9.65	\$0.00	\$77.90
LABORERS	6/1/2026	\$49.40	\$10.65	\$9.75	\$9.65	\$0.00	\$79.45
LABORERS - ZONE 1	12/1/2026	\$50.90	\$10.65	\$9.75	\$9.65	\$0.00	\$80.95
	6/1/2027	\$52.50	\$10.65	\$9.75	\$9.65	\$0.00	\$82.55
	12/1/2027	\$54.10	\$10.65	\$9.75	\$9.65	\$0.00	\$84.15
	6/1/2028	\$55.78	\$10.65	\$9.75	\$9.65	\$0.00	\$85.83
	12/1/2028	\$57.45	\$10.65	\$9.75	\$9.65	\$0.00	\$87.50

Apprentice: LABORER							
Effective Date: 12/1/2025							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	\$28.71	\$10.65	\$9.75	\$9.65	\$0.00	\$58.76
2	70.00	\$33.50	\$10.65	\$9.75	\$9.65	\$0.00	\$63.55
3	80.00	\$38.28	\$10.65	\$9.75	\$9.65	\$0.00	\$68.33
4	90.00	\$43.07	\$10.65	\$9.75	\$9.65	\$0.00	\$73.12

Apprentice: LABORER							
Effective Date: 6/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	\$29.64	\$10.65	\$9.75	\$9.65	\$0.00	\$59.69

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice: LABORER							
Effective Date: 6/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
2	70.00	\$34.58	\$10.65	\$9.75	\$9.65	\$0.00	\$64.63
3	80.00	\$39.52	\$10.65	\$9.75	\$9.65	\$0.00	\$69.57
4	90.00	\$44.46	\$10.65	\$9.75	\$9.65	\$0.00	\$74.51

Apprentice to Journeyworker Ratio: 1:5

LABORER (HEAVY & HIGHWAY)	12/1/2025	\$47.95	\$10.65	\$9.75	\$9.65	\$0.00	\$78.00
LABORERS	6/1/2026	\$49.50	\$10.65	\$9.75	\$9.65	\$0.00	\$79.55
LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2026	\$51.00	\$10.65	\$9.75	\$9.65	\$0.00	\$81.05

Apprentice: LABORER (HEAVY & HIGHWAY)							
Effective Date: 12/1/2025							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	\$29.22	\$10.15	\$9.50	\$9.65	\$0.00	\$58.52
2	70.00	\$34.09	\$10.15	\$9.50	\$9.65	\$0.00	\$63.39
3	80.00	\$38.96	\$10.15	\$9.50	\$9.65	\$0.00	\$68.26
4	90.00	\$43.83	\$10.15	\$9.50	\$9.65	\$0.00	\$73.13

Apprentice: LABORER (HEAVY & HIGHWAY)							
Effective Date: 6/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	\$29.70	\$10.65	\$9.75	\$9.65	\$0.00	\$59.75
2	70.00	\$34.65	\$10.65	\$9.75	\$9.65	\$0.00	\$64.70
3	80.00	\$39.60	\$10.65	\$9.75	\$9.65	\$0.00	\$69.65
4	90.00	\$44.55	\$10.65	\$9.75	\$9.65	\$0.00	\$74.60

Apprentice to Journeyworker Ratio: 1:5

LABORER: CARPENTER TENDER	12/1/2025	\$47.85	\$10.65	\$9.75	\$9.65	\$0.00	\$77.90
LABORERS	6/1/2026	\$49.40	\$10.65	\$9.75	\$9.65	\$0.00	\$79.45
LABORERS - ZONE 1	12/1/2026	\$50.90	\$10.65	\$9.75	\$9.65	\$0.00	\$80.95
	6/1/2027	\$52.50	\$10.65	\$9.75	\$9.65	\$0.00	\$82.55
	12/1/2027	\$54.10	\$10.65	\$9.75	\$9.65	\$0.00	\$84.15
	6/1/2028	\$55.78	\$10.65	\$9.75	\$9.65	\$0.00	\$85.83
	12/1/2028	\$57.45	\$10.65	\$9.75	\$9.65	\$0.00	\$87.50

For apprentice rates see "Apprentice- LABORER"

LABORER: CEMENT FINISHER TENDER	12/1/2025	\$47.85	\$10.65	\$9.75	\$9.65	\$0.00	\$77.90
LABORERS	6/1/2026	\$49.40	\$10.65	\$9.75	\$9.65	\$0.00	\$79.45
LABORERS - ZONE 1	12/1/2026	\$50.90	\$10.65	\$9.75	\$9.65	\$0.00	\$80.95
	6/1/2027	\$52.50	\$10.65	\$9.75	\$9.65	\$0.00	\$82.55

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
	12/1/2027	\$54.10	\$10.65	\$9.75	\$9.65	\$0.00	\$84.15
	6/1/2028	\$55.78	\$10.65	\$9.75	\$9.65	\$0.00	\$85.83
	12/1/2028	\$57.45	\$10.65	\$9.75	\$9.65	\$0.00	\$87.50

For apprentice rates see "Apprentice- LABORER"

LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER LABORERS	12/1/2025	\$48.00	\$10.65	\$9.75	\$9.65	\$0.00	\$78.05
LABORERS - ZONE 1	6/1/2026	\$49.55	\$10.65	\$9.75	\$9.65	\$0.00	\$79.60
	12/7/2026	\$51.05	\$10.65	\$9.75	\$9.65	\$0.00	\$81.10
	6/7/2027	\$52.65	\$10.65	\$9.75	\$9.65	\$0.00	\$82.70
	12/6/2027	\$54.25	\$10.65	\$9.75	\$9.65	\$0.00	\$84.30
	6/5/2028	\$55.93	\$10.65	\$9.75	\$9.65	\$0.00	\$85.98
	12/4/2028	\$57.60	\$10.65	\$9.75	\$9.65	\$0.00	\$87.65

For apprentice rates see "Apprentice- LABORER"

LABORER: MASON TENDER LABORERS	12/1/2025	\$48.10	\$10.65	\$9.75	\$9.65	\$0.00	\$78.15
LABORERS - ZONE 1	6/1/2026	\$49.65	\$10.65	\$9.75	\$9.65	\$0.00	\$79.70
	12/1/2026	\$51.15	\$10.65	\$9.75	\$9.65	\$0.00	\$81.20
	6/1/2027	\$52.75	\$10.65	\$9.75	\$9.65	\$0.00	\$82.80
	12/1/2027	\$54.35	\$10.65	\$9.75	\$9.65	\$0.00	\$84.40
	6/1/2028	\$56.03	\$10.65	\$9.75	\$9.65	\$0.00	\$86.08
	12/1/2028	\$57.70	\$10.65	\$9.75	\$9.65	\$0.00	\$87.75

For apprentice rates see "Apprentice- LABORER"

LABORER: MASON TENDER (HEAVY & HIGHWAY) LABORERS	12/1/2025	\$48.20	\$10.65	\$9.75	\$9.65	\$0.00	\$78.25
LABORERS - ZONE 1 (HEAVY & HIGHWAY)	6/1/2026	\$49.75	\$10.65	\$9.75	\$9.65	\$0.00	\$79.80
	12/1/2026	\$51.25	\$10.65	\$9.75	\$9.65	\$0.00	\$81.30

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"

LABORER: MULTI-TRADE TENDER LABORERS	12/1/2025	\$47.85	\$10.65	\$9.75	\$9.65	\$0.00	\$77.90
LABORERS - ZONE 1	6/1/2026	\$49.40	\$10.65	\$9.75	\$9.65	\$0.00	\$79.45
	12/1/2026	\$50.90	\$10.65	\$9.75	\$9.65	\$0.00	\$80.95
	6/1/2027	\$52.50	\$10.65	\$9.75	\$9.65	\$0.00	\$82.55
	12/1/2027	\$54.10	\$10.65	\$9.75	\$9.65	\$0.00	\$84.15
	6/1/2028	\$55.78	\$10.65	\$9.75	\$9.65	\$0.00	\$85.83
	12/1/2028	\$57.45	\$10.65	\$9.75	\$9.65	\$0.00	\$87.50

For apprentice rates see "Apprentice- LABORER"

LABORER: TREE REMOVER LABORERS	12/1/2025	\$47.85	\$10.65	\$9.75	\$9.65	\$0.00	\$77.90
LABORERS - ZONE 1	6/1/2026	\$49.40	\$10.65	\$9.75	\$9.65	\$0.00	\$79.45
	12/1/2026	\$50.90	\$10.65	\$9.75	\$9.65	\$0.00	\$80.95
	6/1/2027	\$52.50	\$10.65	\$9.75	\$9.65	\$0.00	\$82.55
	12/1/2027	\$54.10	\$10.65	\$9.75	\$9.65	\$0.00	\$84.15
	6/1/2028	\$55.78	\$10.65	\$9.75	\$9.65	\$0.00	\$85.83
	12/1/2028	\$57.45	\$10.65	\$9.75	\$9.65	\$0.00	\$87.50

This classification applies to the removal of standing trees, and the trimming and removal of branches and limbs when related to public works construction or site clearance incidental to construction . For apprentice rates see "Apprentice- LABORER"

LASER BEAM OPERATOR LABORERS	12/1/2025	\$48.10	\$10.65	\$9.75	\$9.65	\$0.00	\$78.15
LABORERS - ZONE 1	6/1/2026	\$49.65	\$10.65	\$9.75	\$9.65	\$0.00	\$79.70
	12/1/2026	\$51.15	\$10.65	\$9.75	\$9.65	\$0.00	\$81.20
	6/1/2027	\$52.75	\$10.65	\$9.75	\$9.65	\$0.00	\$82.80

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
	12/1/2027	\$54.35	\$10.65	\$9.75	\$9.65	\$0.00	\$84.40
	6/1/2028	\$56.03	\$10.65	\$9.75	\$9.65	\$0.00	\$86.08
	12/1/2028	\$57.70	\$10.65	\$9.75	\$9.65	\$0.00	\$87.75

For apprentice rates see "Apprentice- LABORER"

LASER BEAM OPERATOR (HEAVY & HIGHWAY) LABORERS	12/1/2025	\$48.20	\$10.65	\$9.75	\$9.65	\$0.00	\$78.25
LABORERS - ZONE 1 (HEAVY & HIGHWAY)	6/1/2026	\$49.75	\$10.65	\$9.75	\$9.65	\$0.00	\$79.80
	12/1/2026	\$51.25	\$10.65	\$9.75	\$9.65	\$0.00	\$81.30

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"

MARBLE & TILE FINISHERS	2/1/2026	\$52.08	\$12.84	\$15.57	\$5.78	\$0.00	\$86.27
BRICKLAYERS LOCAL 3	8/1/2026	\$53.84	\$12.84	\$15.57	\$5.78	\$0.00	\$88.03
BRICKLAYERS LOCAL 3 - MARBLE & TILE	2/1/2027	\$54.96	\$12.84	\$15.57	\$5.78	\$0.00	\$89.15

Apprentice: MARBLE & TILE FINISHERS							
Effective Date: 2/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	\$26.04	\$12.84	\$15.57	\$5.78	\$0.00	\$60.23
2	60.00	\$31.25	\$12.84	\$15.57	\$5.78	\$0.00	\$65.44
3	70.00	\$36.46	\$12.84	\$15.57	\$5.78	\$0.00	\$70.65
4	80.00	\$41.66	\$12.84	\$15.57	\$5.78	\$0.00	\$75.85
5	90.00	\$46.87	\$12.84	\$15.57	\$5.78	\$0.00	\$81.06

Apprentice: MARBLE & TILE FINISHERS							
Effective Date: 8/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	\$26.92	\$12.84	\$15.57	\$5.78	\$0.00	\$61.11
2	60.00	\$32.30	\$12.84	\$15.57	\$5.78	\$0.00	\$66.49
3	70.00	\$37.69	\$12.84	\$15.57	\$5.78	\$0.00	\$71.88
4	80.00	\$43.07	\$12.84	\$15.57	\$5.78	\$0.00	\$77.26
5	90.00	\$48.46	\$12.84	\$15.57	\$5.78	\$0.00	\$82.65

Apprentice to Journeyworker Ratio: 1:5

MARBLE MASONS, TILELAYERS & TERRAZZO MECH	2/1/2026	\$67.97	\$12.84	\$15.57	\$7.99	\$0.00	\$104.37
BRICKLAYERS LOCAL 3	8/1/2026	\$70.17	\$12.84	\$15.57	\$7.99	\$0.00	\$106.57
BRICKLAYERS LOCAL 3 - MARBLE & TILE	2/1/2027	\$71.57	\$12.84	\$15.57	\$7.99	\$0.00	\$107.97

Apprentice: MARBLE MASONS, TILELAYERS & TERRAZZO MECH							
Effective Date: 2/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	\$33.99	\$12.84	\$15.57	\$7.99	\$0.00	\$70.39
2	60.00	\$40.78	\$12.84	\$15.57	\$7.99	\$0.00	\$77.18

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
MORTAR MIXER LABORERS	12/1/2025	\$48.10	\$10.65	\$9.75	\$9.65	\$0.00	\$78.15
LABORERS - ZONE 1	6/1/2026	\$49.65	\$10.65	\$9.75	\$9.65	\$0.00	\$79.70
	12/1/2026	\$51.15	\$10.65	\$9.75	\$9.65	\$0.00	\$81.20
	6/1/2027	\$52.75	\$10.65	\$9.75	\$9.65	\$0.00	\$82.80
	12/1/2027	\$54.35	\$10.65	\$9.75	\$9.65	\$0.00	\$84.40
	6/1/2028	\$56.03	\$10.65	\$9.75	\$9.65	\$0.00	\$86.08
	12/1/2028	\$57.70	\$10.65	\$9.75	\$9.65	\$0.00	\$87.75

For apprentice rates see "Apprentice- LABORER"

OILER (OTHER THAN TRUCK CRANES,GRADALLS)	12/1/2025	\$25.68	\$16.05	\$13.25	\$3.25	\$0.00	\$58.23
OPERATING ENGINEERS LOCAL 4	6/1/2026	\$26.27	\$16.05	\$13.25	\$3.25	\$0.00	\$58.82
OPERATING ENGINEERS LOCAL 4	12/1/2026	\$26.94	\$16.05	\$13.25	\$3.25	\$0.00	\$59.49

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

OILER (TRUCK CRANES, GRADALLS)	12/1/2025	\$31.65	\$16.05	\$13.25	\$3.25	\$0.00	\$64.20
OPERATING ENGINEERS LOCAL 4	6/1/2026	\$32.37	\$16.05	\$13.25	\$3.25	\$0.00	\$64.92
OPERATING ENGINEERS LOCAL 4	12/1/2026	\$33.17	\$16.05	\$13.25	\$3.25	\$0.00	\$65.72

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

OTHER POWER DRIVEN EQUIPMENT - CLASS II	12/1/2025	\$58.62	\$16.05	\$13.25	\$3.25	\$0.00	\$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	\$59.90	\$16.05	\$13.25	\$3.25	\$0.00	\$92.45
OPERATING ENGINEERS LOCAL 4	12/1/2026	\$61.34	\$16.05	\$13.25	\$3.25	\$0.00	\$93.89

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

PAINTER (BRIDGES/TANKS)	1/1/2026	\$59.56	\$10.35	\$12.00	\$12.60	\$0.00	\$94.51
PAINTERS LOCAL 35							
PAINTERS LOCAL 35 - ZONE 1							

Apprentice: PAINTER (BRIDGES/TANKS)							
Effective Date: 1/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	\$29.78	\$10.35	\$0.00	\$0.00	\$0.00	\$40.13
2	55.00	\$32.76	\$10.35	\$0.00	\$6.93	\$0.00	\$50.04
3	60.00	\$35.74	\$10.35	\$0.00	\$7.56	\$0.00	\$53.65
4	65.00	\$38.71	\$10.35	\$0.00	\$8.19	\$0.00	\$57.25
5	70.00	\$41.69	\$10.35	\$12.00	\$8.82	\$0.00	\$72.86
6	75.00	\$44.67	\$10.35	\$12.00	\$9.45	\$0.00	\$76.47
7	80.00	\$47.65	\$10.35	\$12.00	\$10.08	\$0.00	\$80.08
8	90.00	\$53.60	\$10.35	\$12.00	\$11.34	\$0.00	\$87.29

Apprentice to Journeyworker Ratio: 1:1

PAINTER (SPRAY OR SANDBLAST, NEW) *	1/1/2026	\$56.25	\$10.35	\$12.00	\$12.60	\$0.00	\$91.20
-------------------------------------	----------	---------	---------	---------	---------	--------	---------

* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.

PAINTERS LOCAL 35
PAINTERS LOCAL 35 - ZONE 1

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice: PILE DRIVER							
Effective Date: 8/1/2024							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	\$25.11	\$10.08	\$0.00	\$2.53	\$0.00	\$37.72
2	55.00	\$30.68	\$10.08	\$0.00	\$5.07	\$0.00	\$45.83
3	70.00	\$39.05	\$10.08	\$11.62	\$7.60	\$0.00	\$68.35
4	80.00	\$44.63	\$10.08	\$11.62	\$10.14	\$0.00	\$76.47
Apprentice to Journeyworker Ratio: 1:5							
PIPEFITTER & STEAMFITTER PIPEFITTERS LOCAL 537 PIPEFITTERS LOCAL 537	3/1/2026	\$70.58	\$13.95	\$14.00	\$9.55	\$0.00	\$108.08
Apprentice: PIPEFITTER & STEAMFITTER							
Effective Date: 3/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	40.00	\$28.23	\$13.95	\$0.30	\$9.55	\$0.00	\$52.03
2	45.00	\$31.76	\$13.95	\$14.00	\$9.55	\$0.00	\$69.26
3	60.00	\$42.35	\$13.95	\$14.00	\$9.55	\$0.00	\$79.85
4	70.00	\$49.41	\$13.95	\$14.00	\$9.55	\$0.00	\$86.91
5	80.00	\$56.46	\$13.95	\$14.00	\$9.55	\$0.00	\$93.96
Apprentice to Journeyworker Ratio: 1:3							
PIPELAYER LABORERS LABORERS - ZONE 1	12/1/2025	\$48.10	\$10.65	\$9.75	\$9.65	\$0.00	\$78.15
	6/1/2026	\$49.65	\$10.65	\$9.75	\$9.65	\$0.00	\$79.70
	12/1/2026	\$51.15	\$10.65	\$9.75	\$9.65	\$0.00	\$81.20
	6/1/2027	\$52.75	\$10.65	\$9.75	\$9.65	\$0.00	\$82.80
	12/1/2027	\$54.35	\$10.65	\$9.75	\$9.65	\$0.00	\$84.40
	6/1/2028	\$56.03	\$10.65	\$9.75	\$9.65	\$0.00	\$86.08
	12/1/2028	\$57.70	\$10.65	\$9.75	\$9.65	\$0.00	\$87.75
For apprentice rates see "Apprentice- LABORER"							
PIPELAYER (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2025	\$48.20	\$10.65	\$9.75	\$9.65	\$0.00	\$78.25
	6/1/2026	\$49.75	\$10.65	\$9.75	\$9.65	\$0.00	\$79.80
	12/1/2026	\$51.25	\$10.65	\$9.75	\$9.65	\$0.00	\$81.30
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
PLUMBERS & GASFITTERS PLUMBERS & GASFITTERS LOCAL 12 PLUMBERS & GASFITTERS LOCAL 12	3/2/2026	\$73.89	\$14.32	\$12.61	\$8.00	\$0.00	\$108.82
	8/31/2026	\$76.04	\$14.32	\$12.61	\$8.00	\$0.00	\$110.97
	3/1/2027	\$78.19	\$14.32	\$12.61	\$8.00	\$0.00	\$113.12
	8/30/2027	\$80.34	\$14.32	\$12.61	\$8.00	\$0.00	\$115.27
	2/28/2028	\$82.54	\$14.32	\$12.61	\$8.00	\$0.00	\$117.47
	9/4/2028	\$84.74	\$14.32	\$12.61	\$8.00	\$0.00	\$119.67
	3/5/2029	\$86.94	\$14.32	\$12.61	\$8.00	\$0.00	\$121.87

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
	9/3/2029	\$89.14	\$14.32	\$12.61	\$8.00	\$0.00	\$124.07
	3/4/2030	\$91.09	\$14.32	\$12.61	\$8.00	\$0.00	\$126.02

Apprentice: PLUMBERS & GASFITTERS							
Effective Date: 3/2/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	35.00	\$25.86	\$14.32	\$4.61	\$2.80	\$0.00	\$47.59
2	40.00	\$29.56	\$14.32	\$5.22	\$3.20	\$0.00	\$52.30
3	55.00	\$40.64	\$14.32	\$7.07	\$4.40	\$0.00	\$66.43
4	65.00	\$48.03	\$14.32	\$8.30	\$5.20	\$0.00	\$75.85
5	75.00	\$55.42	\$14.32	\$9.53	\$6.00	\$0.00	\$85.27

Apprentice: PLUMBERS & GASFITTERS							
Effective Date: 8/31/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	35.00	\$26.61	\$14.32	\$4.61	\$2.80	\$0.00	\$48.34
2	40.00	\$30.42	\$14.32	\$5.22	\$3.20	\$0.00	\$53.16
3	55.00	\$41.82	\$14.32	\$7.07	\$5.20	\$0.00	\$68.41
4	65.00	\$49.43	\$14.32	\$8.30	\$5.20	\$0.00	\$77.25
5	75.00	\$57.03	\$14.32	\$9.53	\$6.00	\$0.00	\$86.88

Apprentice to Journeyworker Ratio: 1:2

PNEUMATIC CONTROLS (TEMP.)	3/1/2026	\$70.58	\$13.95	\$14.00	\$9.55	\$0.00	\$108.08
PIPEFITTERS LOCAL 537							
PIPEFITTERS LOCAL 537							
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"							

PNEUMATIC DRILL/TOOL OPERATOR	12/1/2025	\$48.10	\$10.65	\$9.75	\$9.65	\$0.00	\$78.15
LABORERS	6/1/2026	\$49.65	\$10.65	\$9.75	\$9.65	\$0.00	\$79.70
LABORERS - ZONE 1	12/1/2026	\$51.15	\$10.65	\$9.75	\$9.65	\$0.00	\$81.20
	6/1/2027	\$52.75	\$10.65	\$9.75	\$9.65	\$0.00	\$82.80
	12/1/2027	\$54.35	\$10.65	\$9.75	\$9.65	\$0.00	\$84.40
	6/1/2028	\$56.03	\$10.65	\$9.75	\$9.65	\$0.00	\$86.08
	12/1/2028	\$57.70	\$10.65	\$9.75	\$9.65	\$0.00	\$87.75
For apprentice rates see "Apprentice- LABORER"							

PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY)	12/1/2025	\$48.20	\$10.65	\$9.75	\$9.65	\$0.00	\$78.25
LABORERS	6/1/2026	\$49.75	\$10.65	\$9.75	\$9.65	\$0.00	\$79.80
LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2026	\$51.25	\$10.65	\$9.75	\$9.65	\$0.00	\$81.30
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							

POWDERMAN & BLASTER	12/1/2025	\$48.85	\$10.65	\$9.75	\$9.65	\$0.00	\$78.90
LABORERS	6/1/2026	\$50.40	\$10.65	\$9.75	\$9.65	\$0.00	\$80.45
LABORERS - ZONE 1	12/1/2026	\$51.90	\$10.65	\$9.75	\$9.65	\$0.00	\$81.95
	6/1/2027	\$53.50	\$10.65	\$9.75	\$9.65	\$0.00	\$83.55
	12/1/2027	\$55.10	\$10.65	\$9.75	\$9.65	\$0.00	\$85.15

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
	6/1/2028	\$56.78	\$10.65	\$9.75	\$9.65	\$0.00	\$86.83
	12/1/2028	\$58.45	\$10.65	\$9.75	\$9.65	\$0.00	\$88.50
For apprentice rates see "Apprentice- LABORER"							
POWDERMAN & BLASTER (HEAVY & HIGHWAY) LABORERS	12/1/2025	\$48.95	\$10.65	\$9.75	\$9.65	\$0.00	\$79.00
LABORERS - ZONE 1 (HEAVY & HIGHWAY)	6/1/2026	\$50.50	\$10.65	\$9.75	\$9.65	\$0.00	\$80.55
	12/1/2026	\$52.00	\$10.65	\$9.75	\$9.65	\$0.00	\$82.05
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
POWER SHOVEL/DERRICK/TRENCHING MACHINE OPERATING ENGINEERS LOCAL 4	12/1/2025	\$59.28	\$16.05	\$13.25	\$3.25	\$0.00	\$91.83
OPERATING ENGINEERS LOCAL 4	6/1/2026	\$60.58	\$16.05	\$13.25	\$3.25	\$0.00	\$93.13
	12/1/2026	\$62.03	\$16.05	\$13.25	\$3.25	\$0.00	\$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
PUMP OPERATOR (CONCRETE) OPERATING ENGINEERS LOCAL 4	12/1/2025	\$58.62	\$16.05	\$13.25	\$3.25	\$0.00	\$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	\$59.90	\$16.05	\$13.25	\$3.25	\$0.00	\$92.45
	12/1/2026	\$61.34	\$16.05	\$13.25	\$3.25	\$0.00	\$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
PUMP OPERATOR (DEWATERING, OTHER) OPERATING ENGINEERS LOCAL 4	12/1/2025	\$37.97	\$16.05	\$13.25	\$3.25	\$0.00	\$70.52
OPERATING ENGINEERS LOCAL 4	6/1/2026	\$38.83	\$16.05	\$13.25	\$3.25	\$0.00	\$71.38
	12/1/2026	\$39.78	\$16.05	\$13.25	\$3.25	\$0.00	\$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
READY MIX CONCRETE DRIVERS after 4/30/12 (Drivers Hired After 4/30/2012) TEAMSTERS 25 (Metro) - Aggregate TEAMSTERS 25 (Metro) - Aggregate	8/1/2022	\$30.40	\$11.91	\$15.25	\$0.00	\$0.00	\$57.56
READY-MIX CONCRETE DRIVER TEAMSTERS 25 (Metro) - Aggregate TEAMSTERS 25 (Metro) - Aggregate	8/1/2022	\$34.41	\$11.91	\$15.25	\$0.00	\$0.00	\$61.57
RECLAIMERS OPERATING ENGINEERS LOCAL 4	12/1/2025	\$58.62	\$16.05	\$13.25	\$3.25	\$0.00	\$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	\$59.90	\$16.05	\$13.25	\$3.25	\$0.00	\$92.45
	12/1/2026	\$61.34	\$16.05	\$13.25	\$3.25	\$0.00	\$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
RIDE-ON MOTORIZED BUGGY OPERATOR LABORERS	12/1/2025	\$48.10	\$10.65	\$9.75	\$9.65	\$0.00	\$78.15
LABORERS - ZONE 1	6/1/2026	\$49.65	\$10.65	\$9.75	\$9.65	\$0.00	\$79.70
	12/1/2026	\$51.15	\$10.65	\$9.75	\$9.65	\$0.00	\$81.20
	6/1/2027	\$52.75	\$10.65	\$9.75	\$9.65	\$0.00	\$82.80
	12/1/2027	\$54.35	\$10.65	\$9.75	\$9.65	\$0.00	\$84.40
	6/1/2028	\$56.03	\$10.65	\$9.75	\$9.65	\$0.00	\$86.08
	12/1/2028	\$57.70	\$10.65	\$9.75	\$9.65	\$0.00	\$87.75
For apprentice rates see "Apprentice- LABORER"							
ROLLER/SPREADER/MULCHING MACHINE OPERATING ENGINEERS LOCAL 4	12/1/2025	\$58.62	\$16.05	\$13.25	\$3.25	\$0.00	\$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	\$59.90	\$16.05	\$13.25	\$3.25	\$0.00	\$92.45
	12/1/2026	\$61.34	\$16.05	\$13.25	\$3.25	\$0.00	\$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
ROOFER (Inc.Roofer Waterproofing &Roofer Damproofg) ROOFERS LOCAL 33 ROOFERS LOCAL 33	2/1/2026	\$53.53	\$14.53	\$12.67	\$9.03	\$0.00	\$89.76

Apprentice: ROOFER (Inc.Roofer Waterproofing &Roofer Damproofg)							
Effective Date: 2/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	\$26.77	\$14.53	\$6.52	\$9.03	\$0.00	\$56.85
2	60.00	\$32.12	\$14.53	\$12.67	\$9.03	\$0.00	\$68.35
3	65.00	\$34.79	\$14.53	\$12.67	\$9.03	\$0.00	\$71.02
4	75.00	\$40.15	\$14.53	\$12.67	\$9.03	\$0.00	\$76.38
5	85.00	\$45.50	\$14.53	\$12.67	\$9.03	\$0.00	\$81.73

Apprentice Notes
 ** 1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1

Apprentice to Journeyworker Ratio: 1:5

ROOFER SLATE / TILE / PRECAST CONCRETE ROOFERS LOCAL 33 ROOFERS LOCAL 33	2/1/2026	\$53.78	\$14.53	\$12.67	\$9.03	\$0.00	\$90.01
For apprentice rates see "Apprentice- ROOFER"							

SHEETMETAL WORKER SHEETMETAL WORKERS LOCAL 17 SHEETMETAL WORKERS LOCAL 17 - A	2/1/2026	\$62.93	\$14.91	\$18.74	\$9.53	\$2.98	\$109.09
---	----------	---------	---------	---------	--------	--------	----------

Apprentice: SHEETMETAL WORKER							
Effective Date: 2/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	42.00	\$26.43	\$14.91	\$6.19	\$0.00	\$0.00	\$47.53
2	42.00	\$26.43	\$14.91	\$6.19	\$0.00	\$0.00	\$47.53
3	47.00	\$29.58	\$14.91	\$10.93	\$1.25	\$1.62	\$58.29
4	47.00	\$29.58	\$14.91	\$10.93	\$1.25	\$1.62	\$58.29
5	52.00	\$32.72	\$14.91	\$11.66	\$1.50	\$1.74	\$62.53
6	52.00	\$32.72	\$14.91	\$11.66	\$1.75	\$1.75	\$62.79
7	60.00	\$37.76	\$14.91	\$12.84	\$2.00	\$1.93	\$69.44
8	65.00	\$40.90	\$14.91	\$13.58	\$2.25	\$2.04	\$73.68
9	75.00	\$47.20	\$14.91	\$15.06	\$2.75	\$2.28	\$82.20
10	85.00	\$53.49	\$14.91	\$16.53	\$2.75	\$2.49	\$90.17

Apprentice to Journeyworker Ratio: 1:4

SPECIALIZED EARTH MOVING EQUIP < 35 TONS TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	12/1/2025	\$42.34	\$15.41	\$21.78	\$0.00	\$0.00	\$79.53
	6/1/2026	\$43.34	\$15.41	\$21.78	\$0.00	\$0.00	\$80.53
	8/1/2026	\$43.34	\$15.91	\$21.78	\$0.00	\$0.00	\$81.03
	12/1/2026	\$43.34	\$15.91	\$23.52	\$0.00	\$0.00	\$82.77

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
SPECIALIZED EARTH MOVING EQUIP > 35 TONS	12/1/2025	\$42.63	\$15.41	\$21.78	\$0.00	\$0.00	\$79.82
TEAMSTERS JOINT COUNCIL NO. 10	6/1/2026	\$43.63	\$15.41	\$21.78	\$0.00	\$0.00	\$80.82
TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	8/1/2026	\$43.63	\$15.91	\$21.78	\$0.00	\$0.00	\$81.32
	12/1/2026	\$43.63	\$15.91	\$23.52	\$0.00	\$0.00	\$83.06
SPRINKLER FITTER	1/1/2026	\$72.05	\$13.45	\$7.45	\$18.25	\$0.00	\$111.20
SPRINKLER FITTERS LOCAL 550							
SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1							

Apprentice: SPRINKLER FITTER							
Effective Date: 1/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	35.00	\$25.22	\$13.45	\$13.84	\$0.00	\$0.00	\$52.51
2	40.00	\$28.82	\$13.45	\$14.75	\$0.00	\$0.00	\$57.02
3	45.00	\$32.42	\$13.45	\$15.67	\$0.00	\$0.00	\$61.54
4	50.00	\$36.03	\$13.45	\$16.57	\$0.00	\$0.00	\$66.05
5	55.00	\$39.63	\$13.45	\$17.49	\$0.00	\$0.00	\$70.57
6	60.00	\$43.23	\$13.45	\$18.40	\$0.00	\$0.00	\$75.08
7	65.00	\$46.83	\$13.45	\$19.32	\$0.00	\$0.00	\$79.60
8	70.00	\$50.44	\$13.45	\$20.22	\$0.00	\$0.00	\$84.11
9	75.00	\$54.04	\$13.45	\$21.15	\$0.00	\$0.00	\$88.64
10	80.00	\$57.64	\$13.45	\$22.05	\$0.00	\$0.00	\$93.14

Apprentice Notes
 Apprentice entered prior 9/30/10:

Apprentice to Journeyworker Ratio: 1:3

STEAM BOILER OPERATOR	12/1/2025	\$58.62	\$16.05	\$13.25	\$3.25	\$0.00	\$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	\$59.90	\$16.05	\$13.25	\$3.25	\$0.00	\$92.45
OPERATING ENGINEERS LOCAL 4	12/1/2026	\$61.34	\$16.05	\$13.25	\$3.25	\$0.00	\$93.89

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN	12/1/2025	\$58.62	\$16.05	\$13.25	\$3.25	\$0.00	\$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	\$59.90	\$16.05	\$13.25	\$3.25	\$0.00	\$92.45
OPERATING ENGINEERS LOCAL 4	12/1/2026	\$61.34	\$16.05	\$13.25	\$3.25	\$0.00	\$93.89

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

TELECOMMUNICATION TECHNICIAN	3/1/2026	\$53.49	\$13.00	\$14.23	\$7.20	\$0.00	\$87.92
TELECOMMUNICATION TECHNICIAN	9/1/2026	\$55.02	\$13.00	\$14.28	\$7.20	\$0.00	\$89.50
ELECTRICIANS LOCAL 103	3/1/2027	\$55.98	\$13.00	\$14.31	\$7.20	\$0.00	\$90.49
ELECTRICIANS LOCAL 103	9/1/2027	\$57.50	\$13.00	\$14.36	\$7.20	\$0.00	\$92.06
	3/1/2028	\$58.46	\$13.00	\$14.38	\$7.20	\$0.00	\$93.04

For apprentice rates and ratios see "Apprentice- ELECTRICIAN"

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice: TERRAZZO FINISHERS							
Effective Date: 8/1/2026							
Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	\$34.55	\$12.84	\$15.57	\$8.02	\$0.00	\$70.98
2	60.00	\$41.45	\$12.84	\$15.57	\$8.02	\$0.00	\$77.88
3	70.00	\$48.36	\$12.84	\$15.57	\$8.02	\$0.00	\$84.79
4	80.00	\$55.27	\$12.84	\$15.57	\$8.02	\$0.00	\$91.70
5	90.00	\$62.18	\$12.84	\$15.57	\$8.02	\$0.00	\$98.61
Apprentice to Journeyworker Ratio: 1:5							
TEST BORING DRILLER LABORERS	12/1/2025	\$51.95	\$10.65	\$9.75	\$9.80	\$0.00	\$82.15
LABORERS - FOUNDATION AND MARINE	6/1/2026	\$53.50	\$10.65	\$9.75	\$9.80	\$0.00	\$83.70
	12/1/2026	\$55.00	\$10.65	\$9.75	\$9.80	\$0.00	\$85.20
For apprentice rates see "Apprentice- LABORER"							
TEST BORING DRILLER HELPER LABORERS	12/1/2025	\$48.07	\$10.65	\$9.75	\$9.80	\$0.00	\$78.27
LABORERS - FOUNDATION AND MARINE	6/1/2026	\$49.62	\$10.65	\$9.75	\$9.80	\$0.00	\$79.82
	12/1/2026	\$51.12	\$10.65	\$9.75	\$9.80	\$0.00	\$81.32
For apprentice rates see "Apprentice- LABORER"							
TEST BORING LABORER LABORERS	12/1/2025	\$47.95	\$10.65	\$9.75	\$9.80	\$0.00	\$78.15
LABORERS - FOUNDATION AND MARINE	6/1/2026	\$49.50	\$10.65	\$9.75	\$9.80	\$0.00	\$79.70
	12/1/2026	\$51.00	\$10.65	\$9.75	\$9.80	\$0.00	\$81.20
For apprentice rates see "Apprentice- LABORER"							
TRACTORS/PORTABLE STEAM GENERATORS OPERATING ENGINEERS LOCAL 4	12/1/2025	\$58.62	\$16.05	\$13.25	\$3.25	\$0.00	\$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	\$59.90	\$16.05	\$13.25	\$3.25	\$0.00	\$92.45
	12/1/2026	\$61.34	\$16.05	\$13.25	\$3.25	\$0.00	\$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
TRAILERS FOR EARTH MOVING EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10	12/1/2025	\$42.92	\$15.41	\$21.78	\$0.00	\$0.00	\$80.11
TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	6/1/2026	\$43.92	\$15.41	\$21.78	\$0.00	\$0.00	\$81.11
	8/1/2026	\$43.92	\$15.91	\$21.78	\$0.00	\$0.00	\$81.61
	12/1/2026	\$43.92	\$15.91	\$23.52	\$0.00	\$0.00	\$83.35
TUNNEL WORK - COMPRESSED AIR LABORERS	12/1/2025	\$60.18	\$10.65	\$9.75	\$10.25	\$0.00	\$90.83
LABORERS (COMPRESSED AIR)	6/1/2026	\$61.73	\$10.65	\$9.75	\$10.25	\$0.00	\$92.38
	12/1/2026	\$63.23	\$10.65	\$9.75	\$10.25	\$0.00	\$93.88
For apprentice rates see "Apprentice- LABORER"							
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) LABORERS	12/1/2025	\$62.18	\$10.65	\$9.75	\$10.25	\$0.00	\$92.83
LABORERS (COMPRESSED AIR)	6/1/2026	\$63.73	\$10.65	\$9.75	\$10.25	\$0.00	\$94.38
	12/1/2026	\$65.23	\$10.65	\$9.75	\$10.25	\$0.00	\$95.88
For apprentice rates see "Apprentice- LABORER"							
TUNNEL WORK - FREE AIR	12/1/2025	\$52.25	\$10.65	\$9.75	\$10.25	\$0.00	\$82.90

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
LABORERS	6/1/2026	\$53.80	\$10.65	\$9.75	\$10.25	\$0.00	\$84.45
LABORERS (FREE AIR TUNNEL)	12/1/2026	\$55.30	\$10.65	\$9.75	\$10.25	\$0.00	\$85.95
For apprentice rates see "Apprentice- LABORER"							
TUNNEL WORK - FREE AIR (HAZ. WASTE)	12/1/2025	\$54.25	\$10.65	\$9.75	\$10.25	\$0.00	\$84.90
LABORERS	6/1/2026	\$55.80	\$10.65	\$9.75	\$10.25	\$0.00	\$86.45
LABORERS (FREE AIR TUNNEL)	12/1/2026	\$57.30	\$10.65	\$9.75	\$10.25	\$0.00	\$87.95
For apprentice rates see "Apprentice- LABORER"							
VAC-HAUL	12/1/2025	\$42.34	\$15.41	\$21.78	\$0.00	\$0.00	\$79.53
TEAMSTERS JOINT COUNCIL NO. 10	6/1/2026	\$43.34	\$15.41	\$21.78	\$0.00	\$0.00	\$80.53
TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	8/1/2026	\$43.34	\$15.91	\$21.78	\$0.00	\$0.00	\$81.03
	12/1/2026	\$43.34	\$15.91	\$23.52	\$0.00	\$0.00	\$82.77
WAGON DRILL OPERATOR	12/1/2025	\$48.10	\$10.65	\$9.75	\$9.65	\$0.00	\$78.15
LABORERS	6/1/2026	\$49.65	\$10.65	\$9.75	\$9.65	\$0.00	\$79.70
LABORERS - ZONE 1	12/1/2026	\$51.15	\$10.65	\$9.75	\$9.65	\$0.00	\$81.20
	6/1/2027	\$52.75	\$10.65	\$9.75	\$9.65	\$0.00	\$82.80
	12/1/2027	\$54.35	\$10.65	\$9.75	\$9.65	\$0.00	\$84.40
	6/1/2028	\$56.03	\$10.65	\$9.75	\$9.65	\$0.00	\$86.08
	12/1/2028	\$57.70	\$10.65	\$9.75	\$9.65	\$0.00	\$87.75
For apprentice rates see "Apprentice- LABORER"							
WAGON DRILL OPERATOR (HEAVY & HIGHWAY)	12/1/2025	\$48.20	\$10.65	\$9.75	\$9.65	\$0.00	\$78.25
LABORERS	6/1/2026	\$49.75	\$10.65	\$9.75	\$9.65	\$0.00	\$79.80
LABORERS - ZONE 1 (HEAVY & HIGHWAY)	12/1/2026	\$51.25	\$10.65	\$9.75	\$9.65	\$0.00	\$81.30
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
WASTE WATER PUMP OPERATOR	12/1/2025	\$59.28	\$16.05	\$13.25	\$3.25	\$0.00	\$91.83
OPERATING ENGINEERS LOCAL 4	6/1/2026	\$60.58	\$16.05	\$13.25	\$3.25	\$0.00	\$93.13
OPERATING ENGINEERS LOCAL 4	12/1/2026	\$62.03	\$16.05	\$13.25	\$3.25	\$0.00	\$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
WATER METER INSTALLER	3/2/2026	\$73.89	\$14.32	\$12.61	\$8.00	\$0.00	\$108.82
PLUMBERS & GASFITTERS LOCAL 12	8/31/2026	\$76.04	\$14.32	\$12.61	\$8.00	\$0.00	\$110.97
PLUMBERS & GASFITTERS LOCAL 12	3/1/2027	\$78.19	\$14.32	\$12.61	\$8.00	\$0.00	\$113.12
	8/30/2027	\$80.34	\$14.32	\$12.61	\$8.00	\$0.00	\$115.27
	2/2/2028	\$82.54	\$14.32	\$12.61	\$8.00	\$0.00	\$117.47
	9/4/2028	\$84.74	\$14.32	\$12.61	\$8.00	\$0.00	\$119.67
	3/5/2029	\$86.94	\$14.32	\$12.61	\$8.00	\$0.00	\$121.87
	9/3/2029	\$89.14	\$14.32	\$12.61	\$8.00	\$0.00	\$124.07
	3/4/2030	\$91.09	\$14.32	\$12.61	\$8.00	\$0.00	\$126.02
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"							

Additional Apprentice Information

All apprentices must be registered with the Division of Apprenticeship Training(DAS) in accordance with M.G.L.c. 23, §§ 11E-11L. Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the hourly prevailing wage rate established by the Commissioner under the provisions of M.G.L.c. 149, §§ 26-27D.

Apprentice ratios are established by DAS pursuant to M.G.L.c. 23, §§ 11E-11L. Ratios are expressed as the allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified. The ratios listed herein have been taken from relevant private collective bargaining agreements(CBAs) and are provided for illustrative purposes only. They have not been independently verified as being accurate or continuing to be accurate.

Parties having questions regarding what ratio to use should contact DAS.



WAGE THEFT ORDINANCE CERTIFICATION FORM
CITY OF SOMERVILLE CODE OF ORDINANCES / 2019 / ORDINANCE NO. 2019-24 et seq.*.

Instructions: Contractors shall complete this form and sign and date where indicated below. This form will be attached to the contract or subcontract and the certifications made herein shall be incorporated as part of such contract or subcontract.

Purpose: The purpose of this form is to ensure that such vendors comply with applicable federal and state wage laws, treat their employees fairly and ensure that wage theft does not occur on their projects.

Definition of “Wage Theft”: an action by an Employer, their officers, agents or employees causing an Employer not to make a timely and/or complete payment of Wages, not to pay the Minimum Wage or Prevailing Wage, or not to pay Overtime earned and owing to an Employee.

CERTIFICATIONS

Whenever the City of Somerville is procuring construction services subject to the provisions of M.G.L. c. 149, c. 149A or c. 30, §39M, the terms of the Somerville Wage Theft Ordinance shall be incorporated into the procurement documents and made part of the specifications and contract. Any person, company or corporation shall acknowledge, in writing, receipt of said requirements with their bid or proposal and/or contract.

The undersigned bidder, proposer, contractor, subcontractor and/or trade contractor hereby acknowledges receipt of the below referenced requirements and verifies under oath that they will comply with the conditions set forth in the Somerville Wage Theft Ordinance 2019-24, which shall be incorporated into any contract entered into between the City and contractor.

The contractor shall not have been found within the past five years by a court or governmental agency in violation of any law relating to providing workers compensation insurance coverage, misclassification of employees as independent contractors, payment of employer payroll taxes, employee income tax withholding, earned sick time, wage and hour laws, prompt payment laws, or prevailing wage laws.

The contractor shall maintain appropriate industrial accident insurance sufficient to provide coverage for all the employees on the project in accordance with M.G.L. c. 152 and provide documentary proof of such coverage included with the contractor's submitted bid to the inspection services department to be maintained as a public record.

*Read entire ordinance online at:

https://library.municode.com/ma/somerville/ordinances/code_of_ordinances?nodeId=1001376 or request from the Procurement & Contracting Services Department.

Bid ref.:

Contract Number:

The contractor shall properly classify employees as employees rather than independent contractors and treat them accordingly for purposes of prevailing wages and overtime, workers compensation insurance coverage, social security taxes and state and federal income tax withholding. (M.G.L. c. 149, § 148B on employee classification).

The contractor shall comply with M.G.L. c. 151, § 1A and M.G.L. c. 149, § 148 with respect to the payment of wages.

The city contractor must make arrangements to ensure that each employee of every contractor and subcontractor of any tier entering or leaving the project individually completes the appropriate entries in a daily sign-in/out log. The sign in/out log shall include: the location of the project; current date; printed employee name; signed employee name; name of employee's employer and the time of each entry or exiting. The log shall contain a prominent notice that employees are entitled under state law to receive the prevailing wage rate for their work on the project. Such sign-in/out logs shall be provided to the city on a weekly basis with the certified payrolls and shall be a public record.

Each contractor of any tier, prior to performing any work on the project, shall sign under oath and provide to the city contractor a certification that they are not debarred or otherwise prevented from bidding for or performing work on a public project in the Commonwealth of Massachusetts or in the city.

The contractor must comply with state and, where applicable, federal prevailing wage laws. Contractor shall submit weekly certified payrolls to the City for all employees working on the contract including subcontracted workers at all tiers. Contractor shall use the current standard Massachusetts weekly certified payroll report form. Each contractor shall provide a copy of the OSHA 10 card for every employee attached to the first certified payroll they submit on which the employee appears.

Each payment requisition shall include the following certification:

I certify under oath that each payment requisition is in full compliance with all obligations forth in the Wage Theft Ordinance.

SIGNED UNDER THE PAINS AND PENALTIES OF PERJURY,

Signature: _____
(Duly Authorized Representative of Contractor)

Title: _____

Name of Contractor: _____

Date: _____

Online at: <https://www.somervillema.gov/procurement>



OSHA GENERAL CONTRACTOR CERTIFICATION FORM

**Pursuant to Chapter 306 of the Acts of 2004
An Act Relative to the Health and Safety on Construction Projects**

GENERAL CONTRACTOR'S CERTIFICATION – BID FORM

I, the undersigned, hereby certify under penalties of perjury that I, and all subcontractors who are not filed sub-bidders, shall:

(1) that I am able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (2) that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and (3) that all employees to be employed in the work subject to this bid have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration.

As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

Signature: _____
(Individual Submitting Bid)
Duly Authorized

Name of Business or Entity: _____

Date: _____

RETURN THIS FORM WITH YOUR BID



**SOMERVILLE ORDINANCE TO SAFEGUARD
CITY OF SOMERVILLE CODE OF ORDINANCES ARTICLE VIII, SEC. 12-117 et seq.**

VULNERABLE ROAD USERS

Prospective contractors must familiarize themselves with the City of Somerville’s Ordinance to Protect Vulnerable Road Users. The full text of this local law can be found [here](#).

1. **Request for Inspection:** Inspections are conducted on Thursdays from 4pm-7pm at the Somerville Department of Public Works, located at 1 Franey Road. Each inspection takes approximately 20 minutes.
 - a. Any vendor covered by this Ordinance shall complete an inspection request form and email it to fleetinspections@somervillema.gov.
 - b. Please submit request form no later than 3pm on the Tuesday before the requested inspection date.
2. **Fee:** The fee for the initial inspection is \$100. The fee for a renewal inspection (every two years) is \$50.
 - a. Payment of the fee is due upon scheduling of the inspection. The fee can be paid via check or credit card. Checks should be made out to the City of Somerville and include the vendor’s phone number.
3. **Approval:** Vehicles inspected and approved by the Fleet Division will have an inspection approval sticker affixed to the windshield of the vehicle. A copy of the inspection report and certificate of inspection shall be issued to the vendor.
 - a. Inspection stickers are not transferable.
 - b. Any major overhaul of safeguard equipment shall be required to be re-inspected.
4. **Rejection:** If a vehicle is rejected for failing to comply with any of the technical specifications outlined in the ordinance, it shall be corrected and henceforth re-inspected within 30 days at no additional fee.
 - a. If a second inspection results in a rejection, a fee of \$50 will be required for any subsequent inspections.
 - b. Any vendor who fails to comply within 60 days of their first inspection may be subject to having their contract cancelled.
5. **Questions:** Please direct questions about vehicle inspections to Department of Public Works, at: fleetinspections@somervillema.gov or call 617-625-6600 ext. 5100

Acknowledgement

In accordance with Sec. 12-119 “Requirements” in the Ordinance, bidders must sign the following:
Unless certified that the Ordinance is not applicable to this contract or otherwise waived by the City, I acknowledge that my company has installed (or will install prior to commencing work for the contract) side guards, cross-over mirrors or equivalent blind spot countermeasures, convex mirrors or equivalent blind spot countermeasures, side-visible turn signals, and appropriate warning signage, in accordance with SCO Chapter 12, Article VII on all large vehicles it uses or will use within the City of Somerville in connection with any contract.

Authorized Signatory’s Name

Date

Company Name

I certify that the Ordinance does not apply to this contract for the following reason:

- Vehicles do not meet or exceed Class 3 GVWR
- Vehicles do not exceed 15 MPH
- No vehicles on project
- Other: _____

ORDINANCE REQUIREMENTS

LATERAL PROTECTIVE DEVICES (SIDE GUARDS)

- Vehicles must have device installed between the front & rear wheels to help prevent injuries to vulnerable road users, particularly from falling underneath the vehicle.



SIDE-VISIBLE TURN SIGNALS

- Vehicles must have at least one turn signal lamp on each side of the vehicle that is visible from any point to the left and right side along the full length of the vehicle.



CONVEX MIRRORS

- Vehicles must have mirrors which enable the driver to see anything that is three feet above the road and one foot in feet of or along side of the vehicle.



CROSS-OVER MIRRORS

- Vehicles must have mirrors that enable the driver to see anything at least three feet tall passing one foot in front of the vehicle and the area in front of the bumper where direct vision is not possible.



SAFETY DECALS

- Vehicles must have a minimum of three reflective decals on the rear and sides.
- The decals must be "safety yellow" in color and include language or images that warn of blind spots.

COMMON QUESTIONS

WHAT TYPES OF VEHICLES DOES THIS ORDINANCE APPLY TO? This ordinance applies to Class 3 or above vehicles with a gross vehicle weight rating exceeding 10,000 lbs., except for an ambulance, fire apparatus, low-speed vehicle with max speed under 15 mph, or agricultural tractors.

CAN TOOL BOXES BE USED AS SIDE GUARDS? Yes, as long as the tool box meets all of the required measurements in the ordinance.

IF I RENT TRUCKS FOR A JOB, DO THOSE VEHICLES NEED TO BE INSPECTED AND PERMITTED? Yes.

DO SUBCONTRACTORS' TRUCKS WORKING ON A CITY CONTRACT NEED TO BE INSPECTED & PERMITTED? Yes.

WILL THE CITY DO AN OFF-SITE INSPECTION FOR LARGER FLEETS? Yes, depending on the availability of inspectors and the distance to the site.

REGISTER FOR AN INSPECTION

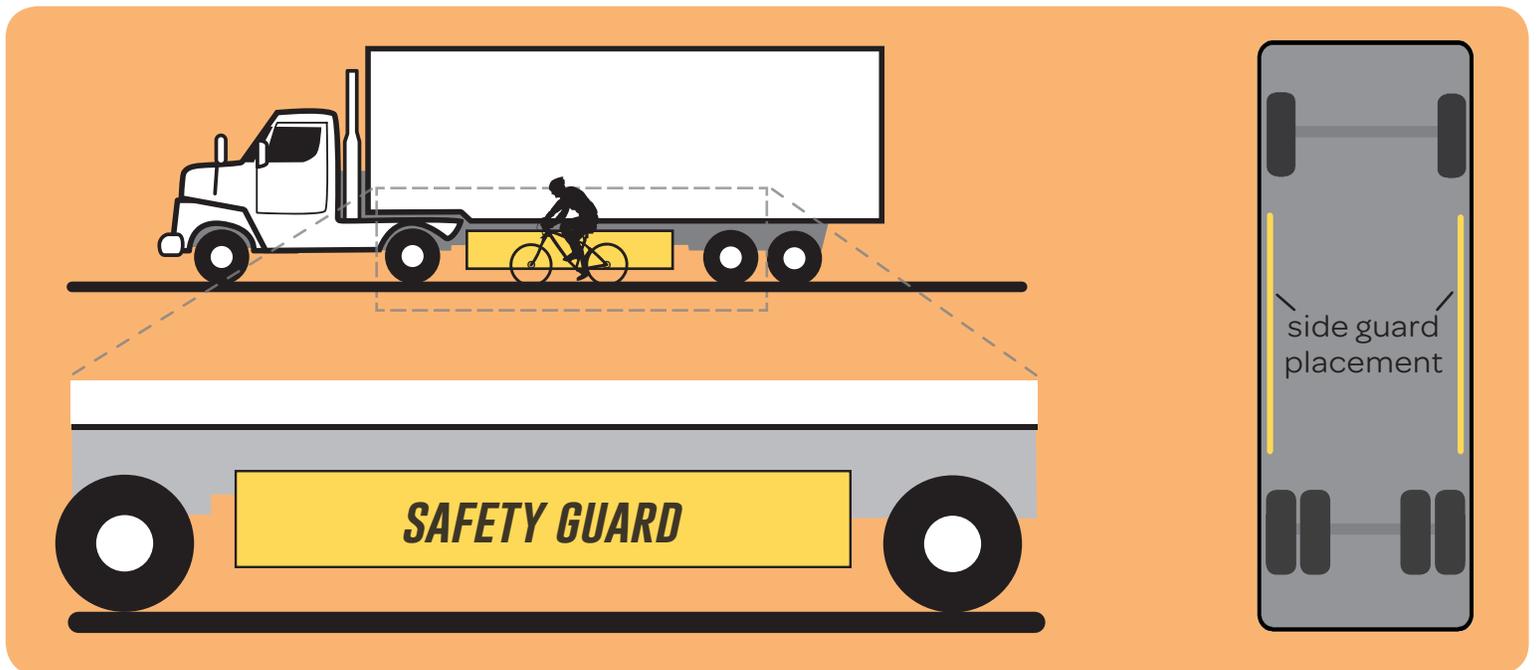
Email inspection forms to: FleetInspections@SomervilleMA.gov



CITY OF SOMERVILLE TRUCK SIDE GUARD ORDINANCE

Collisions with large vehicles are disproportionately likely to result in cyclist and pedestrian fatalities. The City of Somerville's Ordinance to Safeguard Vulnerable Road Users aims to prevent cyclists and pedestrians from the risk of being struck by a large vehicle because of limited driver visibility and lack of side-visible turn signals, as well as falling under the sides of large vehicles and being caught under the wheels.

The ordinance applies to large motor vehicles that are Class 3 or above with a gross vehicle weight rating (GVWR) exceeding 10,000 pounds, except for an ambulance, fire apparatus, low-speed vehicle with a maximum speed under 15 mph, or an agricultural tractor.



Request for Taxpayer Identification Number and Certification

Go to www.irs.gov/FormW9 for instructions and the latest information.

**Give form to the
requester. Do not
send to the IRS.**

Before you begin. For guidance related to the purpose of Form W-9, see *Purpose of Form*, below.

Print or type. See Specific Instructions on page 3.	1	Name of entity/individual. An entry is required. (For a sole proprietor or disregarded entity, enter the owner's name on line 1, and enter the business/disregarded entity's name on line 2.)		
	2	Business name/disregarded entity name, if different from above.		
	3a	Check the appropriate box for federal tax classification of the entity/individual whose name is entered on line 1. Check only one of the following seven boxes. <input type="checkbox"/> Individual/sole proprietor <input type="checkbox"/> C corporation <input type="checkbox"/> S corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Trust/estate <input type="checkbox"/> LLC. Enter the tax classification (C = C corporation, S = S corporation, P = Partnership) _____ Note: Check the "LLC" box above and, in the entry space, enter the appropriate code (C, S, or P) for the tax classification of the LLC, unless it is a disregarded entity. A disregarded entity should instead check the appropriate box for the tax classification of its owner. <input type="checkbox"/> Other (see instructions) _____	4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3): Exempt payee code (if any) _____ Exemption from Foreign Account Tax Compliance Act (FATCA) reporting code (if any) _____ <i>(Applies to accounts maintained outside the United States.)</i>	
	3b	If on line 3a you checked "Partnership" or "Trust/estate," or checked "LLC" and entered "P" as its tax classification, and you are providing this form to a partnership, trust, or estate in which you have an ownership interest, check this box if you have any foreign partners, owners, or beneficiaries. See instructions <input type="checkbox"/>		
	5	Address (number, street, and apt. or suite no.). See instructions.	Requester's name and address (optional)	
	6	City, state, and ZIP code		
	7	List account number(s) here (optional)		

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Social security number									
				-					
or									
Employer identification number									

Note: If the account is in more than one name, see the instructions for line 1. See also *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and, generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here	Signature of U.S. person	Date
------------------	--------------------------	------

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to www.irs.gov/FormW9.

What's New

Line 3a has been modified to clarify how a disregarded entity completes this line. An LLC that is a disregarded entity should check the appropriate box for the tax classification of its owner. Otherwise, it should check the "LLC" box and enter its appropriate tax classification.

New line 3b has been added to this form. A flow-through entity is required to complete this line to indicate that it has direct or indirect foreign partners, owners, or beneficiaries when it provides the Form W-9 to another flow-through entity in which it has an ownership interest. This change is intended to provide a flow-through entity with information regarding the status of its indirect foreign partners, owners, or beneficiaries, so that it can satisfy any applicable reporting requirements. For example, a partnership that has any indirect foreign partners may be required to complete Schedules K-2 and K-3. See the Partnership Instructions for Schedules K-2 and K-3 (Form 1065).

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS is giving you this form because they

must obtain your correct taxpayer identification number (TIN), which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid).
- Form 1099-DIV (dividends, including those from stocks or mutual funds).
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds).
- Form 1099-NEC (nonemployee compensation).
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers).
- Form 1099-S (proceeds from real estate transactions).
- Form 1099-K (merchant card and third-party network transactions).
- Form 1098 (home mortgage interest), 1098-E (student loan interest), and 1098-T (tuition).
- Form 1099-C (canceled debt).
- Form 1099-A (acquisition or abandonment of secured property).

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

Caution: If you don't return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See *What is backup withholding*, later.

By signing the filled-out form, you:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued);
2. Certify that you are not subject to backup withholding; or
3. Claim exemption from backup withholding if you are a U.S. exempt payee; and
4. Certify to your non-foreign status for purposes of withholding under chapter 3 or 4 of the Code (if applicable); and
5. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting is correct. See *What Is FATCA Reporting*, later, for further information.

Note: If you are a U.S. person and a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien;
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States;
- An estate (other than a foreign estate); or
- A domestic trust (as defined in Regulations section 301.7701-7).

Establishing U.S. status for purposes of chapter 3 and chapter 4 withholding. Payments made to foreign persons, including certain distributions, allocations of income, or transfers of sales proceeds, may be subject to withholding under chapter 3 or chapter 4 of the Code (sections 1441–1474). Under those rules, if a Form W-9 or other certification of non-foreign status has not been received, a withholding agent, transferee, or partnership (payor) generally applies presumption rules that may require the payor to withhold applicable tax from the recipient, owner, transferor, or partner (payee). See Pub. 515, *Withholding of Tax on Nonresident Aliens and Foreign Entities*.

The following persons must provide Form W-9 to the payor for purposes of establishing its non-foreign status.

- In the case of a disregarded entity with a U.S. owner, the U.S. owner of the disregarded entity and not the disregarded entity.
- In the case of a grantor trust with a U.S. grantor or other U.S. owner, generally, the U.S. grantor or other U.S. owner of the grantor trust and not the grantor trust.
- In the case of a U.S. trust (other than a grantor trust), the U.S. trust and not the beneficiaries of the trust.

See Pub. 515 for more information on providing a Form W-9 or a certification of non-foreign status to avoid withholding.

Foreign person. If you are a foreign person or the U.S. branch of a foreign bank that has elected to be treated as a U.S. person (under Regulations section 1.1441-1(b)(2)(iv) or other applicable section for chapter 3 or 4 purposes), do not use Form W-9. Instead, use the appropriate Form W-8 or Form 8233 (see Pub. 515). If you are a qualified foreign pension fund under Regulations section 1.897(l)-1(d), or a partnership that is wholly owned by qualified foreign pension funds, that is treated as a non-foreign person for purposes of section 1445 withholding, do not use Form W-9. Instead, use Form W-8EXP (or other certification of non-foreign status).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a saving clause. Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items.

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.
2. The treaty article addressing the income.
3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.
4. The type and amount of income that qualifies for the exemption from tax.
5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if their stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first Protocol) and is relying on this exception to claim an exemption from tax on their scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity, give the requester the appropriate completed Form W-8 or Form 8233.

Backup Withholding

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS 24% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include, but are not limited to, interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, payments made in settlement of payment card and third-party network transactions, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester;
2. You do not certify your TIN when required (see the instructions for Part II for details);
3. The IRS tells the requester that you furnished an incorrect TIN;
4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only); or
5. You do not certify to the requester that you are not subject to backup withholding, as described in item 4 under "*By signing the filled-out form*" above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See *Exempt payee code*, later, and the separate Instructions for the Requester of Form W-9 for more information.

See also *Establishing U.S. status for purposes of chapter 3 and chapter 4 withholding*, earlier.

What Is FATCA Reporting?

The Foreign Account Tax Compliance Act (FATCA) requires a participating foreign financial institution to report all U.S. account holders that are specified U.S. persons. Certain payees are exempt from FATCA reporting. See *Exemption from FATCA reporting code*, later, and the Instructions for the Requester of Form W-9 for more information.

Updating Your Information

You must provide updated information to any person to whom you claimed to be an exempt payee if you are no longer an exempt payee and anticipate receiving reportable payments in the future from this person. For example, you may need to provide updated information if you are a C corporation that elects to be an S corporation, or if you are no longer tax exempt. In addition, you must furnish a new Form W-9 if the name or TIN changes for the account, for example, if the grantor of a grantor trust dies.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of \$50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a \$500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Line 1

You must enter one of the following on this line; **do not** leave this line blank. The name should match the name on your tax return.

If this Form W-9 is for a joint account (other than an account maintained by a foreign financial institution (FFI)), list first, and then circle, the name of the person or entity whose number you entered in Part I of Form W-9. If you are providing Form W-9 to an FFI to document a joint account, each holder of the account that is a U.S. person must provide a Form W-9.

• **Individual.** Generally, enter the name shown on your tax return. If you have changed your last name without informing the Social Security Administration (SSA) of the name change, enter your first name, the last name as shown on your social security card, and your new last name.

Note for ITIN applicant: Enter your individual name as it was entered on your Form W-7 application, line 1a. This should also be the same as the name you entered on the Form 1040 you filed with your application.

• **Sole proprietor.** Enter your individual name as shown on your Form 1040 on line 1. Enter your business, trade, or “doing business as” (DBA) name on line 2.

• **Partnership, C corporation, S corporation, or LLC, other than a disregarded entity.** Enter the entity’s name as shown on the entity’s tax return on line 1 and any business, trade, or DBA name on line 2.

• **Other entities.** Enter your name as shown on required U.S. federal tax documents on line 1. This name should match the name shown on the charter or other legal document creating the entity. Enter any business, trade, or DBA name on line 2.

• **Disregarded entity.** In general, a business entity that has a single owner, including an LLC, and is not a corporation, is disregarded as an entity separate from its owner (a disregarded entity). See Regulations section 301.7701-2(c)(2). A disregarded entity should check the appropriate box for the tax classification of its owner. Enter the owner’s name on line 1. The name of the owner entered on line 1 should never be a disregarded entity. The name on line 1 should be the name shown on the income tax return on which the income should be reported. For

example, if a foreign LLC that is treated as a disregarded entity for U.S. federal tax purposes has a single owner that is a U.S. person, the U.S. owner’s name is required to be provided on line 1. If the direct owner of the entity is also a disregarded entity, enter the first owner that is not disregarded for federal tax purposes. Enter the disregarded entity’s name on line 2. If the owner of the disregarded entity is a foreign person, the owner must complete an appropriate Form W-8 instead of a Form W-9. This is the case even if the foreign person has a U.S. TIN.

Line 2

If you have a business name, trade name, DBA name, or disregarded entity name, enter it on line 2.

Line 3a

Check the appropriate box on line 3a for the U.S. federal tax classification of the person whose name is entered on line 1. Check only one box on line 3a.

IF the entity/individual on line 1 is a(n) . . .	THEN check the box for . . .
• Corporation	Corporation.
• Individual or • Sole proprietorship	Individual/sole proprietor.
• LLC classified as a partnership for U.S. federal tax purposes or • LLC that has filed Form 8832 or 2553 electing to be taxed as a corporation	Limited liability company and enter the appropriate tax classification: P = Partnership, C = C corporation, or S = S corporation.
• Partnership	Partnership.
• Trust/estate	Trust/estate.

Line 3b

Check this box if you are a partnership (including an LLC classified as a partnership for U.S. federal tax purposes), trust, or estate that has any foreign partners, owners, or beneficiaries, and you are providing this form to a partnership, trust, or estate, in which you have an ownership interest. You must check the box on line 3b if you receive a Form W-8 (or documentary evidence) from any partner, owner, or beneficiary establishing foreign status or if you receive a Form W-9 from any partner, owner, or beneficiary that has checked the box on line 3b.

Note: A partnership that provides a Form W-9 and checks box 3b may be required to complete Schedules K-2 and K-3 (Form 1065). For more information, see the Partnership Instructions for Schedules K-2 and K-3 (Form 1065).

If you are required to complete line 3b but fail to do so, you may not receive the information necessary to file a correct information return with the IRS or furnish a correct payee statement to your partners or beneficiaries. See, for example, sections 6698, 6722, and 6724 for penalties that may apply.

Line 4 Exemptions

If you are exempt from backup withholding and/or FATCA reporting, enter in the appropriate space on line 4 any code(s) that may apply to you.

Exempt payee code.

- Generally, individuals (including sole proprietors) are not exempt from backup withholding.
- Except as provided below, corporations are exempt from backup withholding for certain payments, including interest and dividends.
- Corporations are not exempt from backup withholding for payments made in settlement of payment card or third-party network transactions.
- Corporations are not exempt from backup withholding with respect to attorneys’ fees or gross proceeds paid to attorneys, and corporations that provide medical or health care services are not exempt with respect to payments reportable on Form 1099-MISC.

The following codes identify payees that are exempt from backup withholding. Enter the appropriate code in the space on line 4.

1—An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2).

- 2—The United States or any of its agencies or instrumentalities.
- 3—A state, the District of Columbia, a U.S. commonwealth or territory, or any of their political subdivisions or instrumentalities.
- 4—A foreign government or any of its political subdivisions, agencies, or instrumentalities.
- 5—A corporation.
- 6—A dealer in securities or commodities required to register in the United States, the District of Columbia, or a U.S. commonwealth or territory.
- 7—A futures commission merchant registered with the Commodity Futures Trading Commission.
- 8—A real estate investment trust.
- 9—An entity registered at all times during the tax year under the Investment Company Act of 1940.
- 10—A common trust fund operated by a bank under section 584(a).
- 11—A financial institution as defined under section 581.
- 12—A middleman known in the investment community as a nominee or custodian.
- 13—A trust exempt from tax under section 664 or described in section 4947.

The following chart shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 13.

IF the payment is for . . .	THEN the payment is exempt for . . .
• Interest and dividend payments	All exempt payees except for 7.
• Broker transactions	Exempt payees 1 through 4 and 6 through 11 and all C corporations. S corporations must not enter an exempt payee code because they are exempt only for sales of noncovered securities acquired prior to 2012.
• Barter exchange transactions and patronage dividends	Exempt payees 1 through 4.
• Payments over \$600 required to be reported and direct sales over \$5,000 ¹	Generally, exempt payees 1 through 5. ²
• Payments made in settlement of payment card or third-party network transactions	Exempt payees 1 through 4.

¹ See Form 1099-MISC, Miscellaneous Information, and its instructions.

² However, the following payments made to a corporation and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, gross proceeds paid to an attorney reportable under section 6045(f), and payments for services paid by a federal executive agency.

Exemption from FATCA reporting code. The following codes identify payees that are exempt from reporting under FATCA. These codes apply to persons submitting this form for accounts maintained outside of the United States by certain foreign financial institutions. Therefore, if you are only submitting this form for an account you hold in the United States, you may leave this field blank. Consult with the person requesting this form if you are uncertain if the financial institution is subject to these requirements. A requester may indicate that a code is not required by providing you with a Form W-9 with "Not Applicable" (or any similar indication) entered on the line for a FATCA exemption code.

A—An organization exempt from tax under section 501(a) or any individual retirement plan as defined in section 7701(a)(37).

B—The United States or any of its agencies or instrumentalities.

C—A state, the District of Columbia, a U.S. commonwealth or territory, or any of their political subdivisions or instrumentalities.

D—A corporation the stock of which is regularly traded on one or more established securities markets, as described in Regulations section 1.1472-1(c)(1)(i).

E—A corporation that is a member of the same expanded affiliated group as a corporation described in Regulations section 1.1472-1(c)(1)(i).

F—A dealer in securities, commodities, or derivative financial instruments (including notional principal contracts, futures, forwards, and options) that is registered as such under the laws of the United States or any state.

G—A real estate investment trust.

H—A regulated investment company as defined in section 851 or an entity registered at all times during the tax year under the Investment Company Act of 1940.

I—A common trust fund as defined in section 584(a).

J—A bank as defined in section 581.

K—A broker.

L—A trust exempt from tax under section 664 or described in section 4947(a)(1).

M—A tax-exempt trust under a section 403(b) plan or section 457(g) plan.

Note: You may wish to consult with the financial institution requesting this form to determine whether the FATCA code and/or exempt payee code should be completed.

Line 5

Enter your address (number, street, and apartment or suite number). This is where the requester of this Form W-9 will mail your information returns. If this address differs from the one the requester already has on file, enter "NEW" at the top. If a new address is provided, there is still a chance the old address will be used until the payor changes your address in their records.

Line 6

Enter your city, state, and ZIP code.

Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have, and are not eligible to get, an SSN, your TIN is your IRS ITIN. Enter it in the entry space for the Social security number. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN.

If you are a single-member LLC that is disregarded as an entity separate from its owner, enter the owner's SSN (or EIN, if the owner has one). If the LLC is classified as a corporation or partnership, enter the entity's EIN.

Note: See *What Name and Number To Give the Requester*, later, for further clarification of name and TIN combinations.

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local SSA office or get this form online at www.SSA.gov. You may also get this form by calling 800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at www.irs.gov/EIN. Go to www.irs.gov/Forms to view, download, or print Form W-7 and/or Form SS-4. Or, you can go to www.irs.gov/OrderForms to place an order and have Form W-7 and/or Form SS-4 mailed to you within 15 business days.

If you are asked to complete Form W-9 but do not have a TIN, apply for a TIN and enter "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, you will generally have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note: Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon. See also *Establishing U.S. status for purposes of chapter 3 and chapter 4 withholding*, earlier, for when you may instead be subject to withholding under chapter 3 or 4 of the Code.

Caution: A disregarded U.S. entity that has a foreign owner must use the appropriate Form W-8.

Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if item 1, 4, or 5 below indicates otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). In the case of a disregarded entity, the person identified on line 1 must sign. Exempt payees, see *Exempt payee code*, earlier.

Signature requirements. Complete the certification as indicated in items 1 through 5 below.

1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983. You must give your correct TIN, but you do not have to sign the certification.

2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983. You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

3. Real estate transactions. You must sign the certification. You may cross out item 2 of the certification.

4. Other payments. You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments made in settlement of payment card and third-party network transactions, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), ABL accounts (under section 529A), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions. You must give your correct TIN, but you do not have to sign the certification.

What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account) other than an account maintained by an FFI	The actual owner of the account or, if combined funds, the first individual on the account ¹
3. Two or more U.S. persons (joint account maintained by an FFI)	Each holder of the account
4. Custodial account of a minor (Uniform Gift to Minors Act)	The minor ²
5. a. The usual revocable savings trust (grantor is also trustee)	The grantor-trustee ¹
b. So-called trust account that is not a legal or valid trust under state law	The actual owner ¹
6. Sole proprietorship or disregarded entity owned by an individual	The owner ³
7. Grantor trust filing under Optional Filing Method 1 (see Regulations section 1.671-4(b)(2)(i)(A))**	The grantor*

For this type of account:	Give name and EIN of:
8. Disregarded entity not owned by an individual	The owner
9. A valid trust, estate, or pension trust	Legal entity ⁴
10. Corporation or LLC electing corporate status on Form 8832 or Form 2553	The corporation
11. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
12. Partnership or multi-member LLC	The partnership
13. A broker or registered nominee	The broker or nominee
14. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity
15. Grantor trust filing Form 1041 or under the Optional Filing Method 2, requiring Form 1099 (see Regulations section 1.671-4(b)(2)(i)(B))**	The trust

¹ List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

² Circle the minor's name and furnish the minor's SSN.

³ You must show your individual name on line 1, and enter your business or DBA name, if any, on line 2. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

⁴ List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.)

* **Note:** The grantor must also provide a Form W-9 to the trustee of the trust.

** For more information on optional filing methods for grantor trusts, see the Instructions for Form 1041.

Note: If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

Secure Your Tax Records From Identity Theft

Identity theft occurs when someone uses your personal information, such as your name, SSN, or other identifying information, without your permission to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax return preparer.

If your tax records are affected by identity theft and you receive a notice from the IRS, respond right away to the name and phone number printed on the IRS notice or letter.

If your tax records are not currently affected by identity theft but you think you are at risk due to a lost or stolen purse or wallet, questionable credit card activity, or a questionable credit report, contact the IRS Identity Theft Hotline at 800-908-4490 or submit Form 14039.

For more information, see Pub. 5027, Identity Theft Information for Taxpayers.

Victims of identity theft who are experiencing economic harm or a systemic problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 877-777-4778 or TTY/TDD 800-829-4059.

Protect yourself from suspicious emails or phishing schemes.

Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to phishing@irs.gov. You may also report misuse of the IRS name, logo, or other IRS property to the Treasury Inspector General for Tax Administration (TIGTA) at 800-366-4484. You can forward suspicious emails to the Federal Trade Commission at spam@uce.gov or report them at www.ftc.gov/complaint. You can contact the FTC at www.ftc.gov/idtheft or 877-IDTHEFT (877-438-4338). If you have been the victim of identity theft, see www.IdentityTheft.gov and Pub. 5027.

Go to www.irs.gov/IdentityTheft to learn more about identity theft and how to reduce your risk.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons (including federal agencies) who are required to file information returns with the IRS to report interest, dividends, or certain other income paid to you; mortgage interest you paid; the acquisition or abandonment of secured property; the cancellation of debt; or contributions you made to an IRA, Archer MSA, or HSA. The person collecting this form uses the information on the form to file information returns with the IRS, reporting the above information. Routine uses of this information include giving it to the Department of Justice for civil and criminal litigation and to cities, states, the District of Columbia, and U.S. commonwealths and territories for use in administering their laws. The information may also be disclosed to other countries under a treaty, to federal and state agencies to enforce civil and criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism. You must provide your TIN whether or not you are required to file a tax return. Under section 3406, payors must generally withhold a percentage of taxable interest, dividends, and certain other payments to a payee who does not give a TIN to the payor. Certain penalties may also apply for providing false or fraudulent information.



SECRETARY OF THE COMMONWEALTH'S

CERTIFICATE OF GOOD STANDING

CERTIFICATE OF GOOD STANDING as provided by the Secretary of the Commonwealth

The **Awarded Vendor** must comply with our request for a **CURRENT "Certificate of Good Standing"** provided by the Secretary of the Commonwealth's Office

NOTE: A Certificate of Good Standing provided by the Department of Revenue will NOT be accepted. The Certificate *must* be provided by the Secretary of the Commonwealth's Office.

If you require information on how to obtain the "Certificate of Good Standing" or Certificate of Registration (Foreign Corporations) from the Commonwealth of Massachusetts, please call the

Secretary of The Commonwealth's Office at (617) 727-2850 (Press #1) located at One (1) Ashburton Place, 17 Floor, Boston, MA 02133 or you may access their web site at:
<http://corp.sec.state.ma.us/CorpWeb/Certificates/CertificateOrderForm.aspx>

If your company is incorporated outside of Massachusetts and therefore is a "foreign corporation", but is registered to do business in Massachusetts, please comply with our request for the Certificate of Registration from the Commonwealth of Massachusetts. If your company is a foreign corporation, but is not registered to do business in Massachusetts, please provide the Certificate of Good Standing from your state of incorporation.

Please note that without the above certificate (s), the City of Somerville cannot execute your contract.

IMPORTANT NOTICE

Requests for Certificates of Good Standing by mail may take a substantial amount of time. A certificate may be obtained immediately in person at the Secretary's Office at the address above. Also, at this time, the Secretary of State's Office may not have your current annual report recorded. If this is the case, and you are therefore unable to obtain the Certificate of Good Standing, please forward a copy of your annual report filing fee check with your signed contracts. Please forward your original Certificate of Good Standing to the Purchasing Department upon receipt.

INSURANCE SPECIFICATIONS

INSURANCE REQUIREMENTS FOR AWARDED VENDOR ONLY:

Prior to commencing performance of any work or supplying materials or equipment covered by these specifications, the contractor shall furnish to the Office of the Chief Procurement Officer a Certificate of Insurance evidencing the following:

A. GENERAL LIABILITY - Comprehensive Form

Bodily Injury Liability.....\$ One Million

Property Damage Liability.....\$ One Million

B. COVERAGE FOR PAYMENT OF WORKER'S COMPENSATION BENEFIT PURSUANT TO CHAPTER 152 OF THE MASSACHUSETTS GENERAL LAWS IN THE AMOUNT AS LISTED BELOW:

WORKER'S COMPENSATION.....\$ Statutory

EMPLOYERS' LIABILITY.....\$ Statutory

C. AUTOMOBILE LIABILITY INSURANCE AS LISTED BELOW:

BODILY INJURY LIABILITY.....\$ STATUTORY

1. A contract will not be executed unless a certificate (s) of insurance evidencing above-described coverage is attached.
2. Failure to have the above-described coverage in effect during the entire period of the contract shall be deemed to be a breach of the contract.
3. All applicable insurance policies shall read:
"CITY OF SOMERVILLE" as a certificate holder and as an additional insured for general liability only along with a description of operation in the space provided on the certificate.

Certificate Should Be Made Out To:
City Of Somerville
c/o Procurement and Contracting Services Department
93 Highland Avenue
Somerville, MA 02143

Note: If your insurance expires during the life of this contract, you shall be responsible to submit a new certificate(s) covering the period of the contract. No payment will be made on a contract with an expired insurance certificate.



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:	
	PHONE (A/C, No. Ext):	FAX (A/C, No):
INSURED	E-MAIL ADDRESS:	
	INSURER(S) AFFORDING COVERAGE	
	NAIC #	
	INSURER A :	
	INSURER B :	
	INSURER C :	
INSURER D :		
INSURER E :		
INSURER F :		

COVERAGES

CERTIFICATE NUMBER:

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
	GENERAL LIABILITY <input type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC						EACH OCCURRENCE \$ DAMAGE TO RENTED PREMISES (Ea occurrence) \$ MED EXP (Any one person) \$ PERSONAL & ADV INJURY \$ GENERAL AGGREGATE \$ PRODUCTS - COMP/OP AGG \$
	AUTOMOBILE LIABILITY <input type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> HIRED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> NON-OWNED AUTOS						COMBINED SINGLE LIMIT (Ea accident) \$ BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$
	UMBRELLA LIAB <input type="checkbox"/> OCCUR EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED <input type="checkbox"/> RETENTION \$						EACH OCCURRENCE \$ AGGREGATE \$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N <input type="checkbox"/>	N/A				WC STATUTORY LIMITS <input type="checkbox"/> OTH-ER <input type="checkbox"/> E.L. EACH ACCIDENT \$ E.L. DISEASE - EA EMPLOYEE \$ E.L. DISEASE - POLICY LIMIT \$

ADD "X" HERETO CERTIFY THAT THE CITY OF SOMERVILLE IS AN ADDITIONAL INSURED

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

DESCRIPTION OF PROJECT, SOLICITATION NUMBER AND THAT THE CITY OF SOMERVILLE IS A CERTIFICATE HOLDER AND ADDITIONAL INSURED

CERTIFICATE HOLDER

CANCELLATION

CERTIFICATES SHOULD BE MADE OUT TO:
CITY OF SOMERVILLE
c/o PURCHASING DEPARTMENT
93 HIGHLAND AVE
SOMERVILLE, MA 02143

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

**STATEMENT OF MANAGEMENT
For Contracts over \$100,000**

In accordance with M.G.L. Chapter 30, Section 39R, the undersigned successful bidder states that its system of internal accounting controls and that of its subsidiaries reasonably assure (1) that transactions are executed in accordance with management's general and specific authorization; (2) that transactions are recorded as necessary to permit preparation of financial statements in conformity with generally accepted accounting principles, and to maintain accountability for assets; (3) that access to assets is permitted only in accordance with management's general or specific authorization, and (4) that the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action was taken with respect to any difference.

Executed this _____ day of _____, _____

On behalf of _____
(Name of Successful Bidder)

(Address and telephone of Successful Bidder)

(Name and title of person signing statement)

By: _____
(Signature)

CERTIFIED PUBLIC ACCOUNTANT STATEMENT

In accordance with M.G.L. 30, Section 39R I, _____
a certified public accountant, state that I have examined the above Statement of Management on internal accounting controls, and that in my opinion (1) the representations of management are consistent with the result of management's evaluation of the system of internal accounting controls; and (2) that such representations of management are, in addition, reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the above referenced successful bidder's financial statements.

(Signature)

(Business name, address and telephone number)

**PART 2: SAMPLE CONSTRUCTION CONTRACT / CITY'S
GENERAL TERMS AND CONDITIONS**

APPENDIX D
General Conditions

GENERAL TERMS AND CONDITIONS OF THE CONTRACT
FOR CONSTRUCTION, RECONSTRUCTION, ALTERATIONS,
REMODELING, OR REPAIR OF ANY PUBLIC BUILDING OR PUBLIC WORKS
IN THE CITY OF SOMERVILLE

TABLE OF CONTENTS

Article 1: DEFINITIONS
Article 2: ABOUT THE CONTRACT DOCUMENTS
Article 3: THE CITY
Article 4: THE DESIGN PROFESSIONAL
Article 5: THE CONTRACTOR
Article 6: SUBCONTRACTORS
Article 7: PERFORMANCE AND PAYMENT BONDS
Article 8: INSURANCE REQUIREMENTS
Article 9: TESTS AND INSPECTIONS
Article 10: UNCOVERING AND CORRECTING WORK
Article 11: CHANGES IN THE WORK
Article 12: CHANGE IN THE CONTRACT TIME
Article 13: PAYMENTS
Article 14: SUBSTANTIAL COMPLETION
Article 15: GUARANTEES AND WARRANTIES
Article 16: CLAIMS
Article 17: EMERGENCIES
Article 18: TERMINATION OR SUSPENSION OF THE CONTRACT
Article 19: AMERICANS WITH DISABILITIES ACT
Article 20: WRITTEN NOTICE TO THE PARTIES
Article 21: MISCELLANEOUS PROVISIONS

ARTICLE 1
DEFINITIONS

1.1. In General.

1.1.1. **Well-known meanings.** When words or phrases that have a well-known technical, or construction industry, or trade meaning are used in the Contract Documents, such words or phrases shall be interpreted in accordance with that meaning, unless otherwise stated.

1.1.2. **Capitalization.** The words and terms defined in this Article are capitalized in these General Terms and Conditions of the Contract. Other capitalized words may refer to a specific document found in the Contract Documents.

1.1.3. **Persons.** Whenever the word person or persons is used, it includes, unless otherwise stated, entity or entities, respectively, including, but not limited to, corporations, partnerships, and joint venturers.

1.1.4. **Singular and Plural.** The following terms have the meanings indicated which are applicable to both the singular and the plural thereof.

1.2. Definitions.

1.2.1. **Agreement.** The Agreement is the written document between the City and the Contractor which is titled: Owner-Contractor Public Construction Agreement, which is the executed portion of the Contract, and which forms a part of the Contract. The Agreement also includes all documents required to be attached thereto, including, but not limited to, these general conditions, the performance bond, the labor and materials or payment bonds, certificates of insurance, and all Modifications of the Agreement.

1.2.2. **Change Order.** A Change Order is a document which is signed by the Contractor, the Design Professional, and the City; which is directed to the Contractor; which authorizes the Contractor to make an addition to, a deletion from or a revision in the Work, or an adjustment in the Contract Sum or in the Contract Time; and which is issued on or after the date of the Agreement between the Contractor and the City.

1.2.3. **City.** The City refers to the City of Somerville, which is the owner of the Project and is the public awarding authority with whom the Contractor has entered into the Contract and for whom the Work is to be provided.

1.2.4. **Claim.** A Claim is a dispute, demand, or assertion by one of the parties arising out of or relating to the Contract for which such party is seeking relief.

1.2.5. **Contract.** The Contract consists of all the Contract Documents. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification to the Contract signed by both parties.

1.2.6. **Contract Documents.** The Contract Documents consist of the Agreement; the notice of award of the Contract; the Notice to Proceed; the entire Project Manual; Change Orders; Construction Change Directives; the Contractor's Bid and all accompanying documents; and the Design Professional's written interpretations and clarifications issued on or after the issuance of the Notice to Proceed. Shop Drawing submittals and reports or drawings utilized by the Design Professional in preparing the Contract Documents are not Contract Documents.

1.2.7. **Contractor.** The Contractor is the person who is awarded the Contract for the Project herein pursuant to M.G.L. c. 149, §44A or M.G.L. c. 39, §39M; and is identified in the Agreement as such. The term "Contractor" is intended to include the Contractor as well as its authorized representative(s).

1.2.8. **Contract Sum.** The Contract Sum is the total amount stated in the Agreement payable by the City to the Contractor for the completion of the Work in accordance with the Contract Documents.

1.2.9. **Contract Time.** Unless otherwise provided, the Contract Time is the number of days allotted in the Contract Documents or the dates stated in the Agreement, including authorized adjustments, for Substantial Completion.

1.2.10. **Coordination Drawings.** Coordination Drawings are those drawings, which are prepared by the Contractor or a Subcontractor that show the exact alignment, physical locations, and configuration of the mechanical, electrical, and fire protection installations.

1.2.11. **Day.** The term "day" shall mean calendar day unless otherwise stated.

1.2.12. **Design Professional.** The Design Professional is the person lawfully licensed to practice architecture, engineering, or landscape architecture and has been selected by the City to administer the Contract. The term "Design Professional," while referred to in the singular, means the Design Professional and/or the Design Professional's representative.

1.2.13. **Field Order.** A Field Order is a written order issued by the Design Professional which orders minor changes in the Work, but which does not involve a change in the Contract Sum or the Contract Time.

1.2.14. **Final Completion.** Final Completion is the point in time when the Design Professional finds that the Work has been fully completed in accordance with the Contract Documents. Final Completion shall be no later than thirty (30) days after Substantial Completion.

1.2.15. **General Requirements.** General Requirements refer to Sections of Division 1 of the Specifications.

1.2.16. Modification. A Modification is a written instrument that amends the Contract after execution of the Agreement.

1.2.17. Notice to Proceed. A Notice to Proceed is a written notice given by the **City**, or the **Design Professional**, to the **Contractor** fixing the date on which the Contract Time will begin to run and on which the **Contractor** shall start to perform its obligations under the Contract Documents.

1.2.18. Plans. The Plans are the drawings which are the graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, showing the design, location, dimensions, scope, extent, and character of the Work to be furnished and performed by the **Contractor** and which have been prepared or approved by the **Design Professional**.

1.2.19. Product Data. Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the **Contractor** to illustrate materials or equipment for some portion of the Work. Product Data are not considered part of the Contract Documents.

1.2.20. Project. The Project is the total Work to be provided under the Contract Documents and may be the whole or a part as indicated elsewhere in the Contract Documents and may include construction by the **City** or by separate contractors. The Project is the Work described in the invitation to bid (advertisement) and Specifications and illustrated by the Plans, including any Modifications.

1.2.21. Project Manual. The Project Manual is the entire set of bidding documents which includes, but is not limited to, the invitation to bid (advertisement), the instructions to bidders, all of the forms, the wage rates, all City and state requirements, the General Terms and Conditions of the Contract, any supplementary conditions thereto, the Plans, the Specifications, and all addenda.

1.2.22. Proposed Change Order. A Proposed Change Order is a Change Order that has been submitted by the **Contractor** to the **Design Professional**, is under review, and has not been approved by the **City**.

1.2.23. Samples. Samples are physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged. Samples are not considered part of the Contract Documents.

1.2.24. Shop Drawings. Shop Drawings are all drawings, diagrams, illustrations, schedules, and other information that are specifically prepared or assembled by or for the **Contractor** and submitted by the **Contractor** to illustrate some portion of the Work. Shop Drawings are not considered part of the Contract Documents.

1.2.25. Site. The Site is the location of the Project and of the Work.

1.2.26. Specifications. Specifications are those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards, and workmanship as applied to the Work and certain administrative details applicable thereto.

1.2.27. Subcontractor. A Subcontractor is a person who contracts directly with the **Contractor**, unless otherwise stated.

1.2.28. Submittals. Submittals are those Shop Drawings, Product Data, Samples, or any other required document that are provided to the Design Professional for review and approval.

1.2.29. Substantial Completion. Substantial Completion means that the Work has been completed and the Site or the facility is opened for full and intended public use, except for minor incomplete or unsatisfactory items that do not materially impair the usefulness of the Work. The **Design Professional** shall decide what constitutes "minor," "incomplete," "unsatisfactory," and "materially" and the **Design Professional's** decision shall be final.

1.2.30. Sub-subcontractor. A Sub-subcontractor is a person who has contracted directly with a Subcontractor.

1.2.31. Supplier. A Supplier is a manufacturer, fabricator, distributor, material person, or vendor having a direct contract with the Contractor or with any Subcontractor to furnish materials or equipment to be incorporated into the Work by the Contractor or any Subcontractor.

1.2.32. Work. Work refers to the services and the entire completed construction or the various separately identifiable parts thereof required by the Contract Documents, including all labor, materials, and equipment furnished, furnished and incorporated into the Project, or to be provided by the **Contractor** to fulfill the **Contractor's** obligations. The Work may constitute the whole or a part of the Project.

1.2.33. Construction Change Directive. A Construction Change Directive is a written directive to the **Contractor** ordering an addition to, a deletion from, or a revision to the Work issued on or after the date of the Agreement, signed by the **City**, and recommended by the **Design Professional**.

ARTICLE 2

ABOUT THE CONTRACT DOCUMENTS

2.1. Priority/Conflict.

2.1.1. Priority Among Contract Documents. In the event of conflict among the Contract Documents, the Contract Documents shall be construed according to the following priorities:

- Highest Priority: Modifications
- Second Priority: Agreement
- Third Priority: Addenda-later date to take precedence
- Fourth Priority: Supplementary General Conditions
- Fifth Priority: General Conditions
- Sixth Priority: Plans and Specifications

2.1.1.1. If there is a conflict between the Plans and Specifications, the figured dimensions shall govern over the scaled dimensions. Detailed Plans shall govern over the general Plans. Larger scale Plans shall take precedence over smaller scale Plans. Plans shall govern over Shop Drawings. Whenever notes, specifications, dimensions, details, or schedules in the Specifications or in the Plans, or between the Specifications and the Plans, or in all other instances not specifically noted above, the **Contractor** shall provide, unless otherwise directed by a Modification of the Contract, the better quality or greater quantity of Work at no increase in the Contract Sum or in the Contract Time.

2.1.1.2. Compliance with these priority conditions shall not justify any changes in the Work or any increase in the Contract Sum or Contract Time, unless any such compliance results in Work that may not be reasonably inferred from the Contract Documents as being required to produce the intended result as determined by the **Design Professional**.

2.1.2. Review of the Contract Documents and Field Conditions and Discovery of Conflict, Error, Ambiguity, or Discrepancy. Before starting the Work, and during the progress thereof, the **Contractor** shall carefully study and compare the Contract Documents with each other and with the information furnished by the **City** pursuant to Article 3 and shall at once report to the **Design Professional** any error, inconsistency, or omission the **Contractor** may discover. Any necessary change shall be ordered as provided in Article 11, subject to the requirements of any other provisions of the Contract Documents. The **Contractor** shall not proceed with the Work affected thereby (except in an emergency) until a Modification has been issued. If the **Contractor** proceeds with the Work having discovered such errors, inconsistencies, or omissions contrary to the provisions contained herein, or if by reasonable study of the Contract Documents the **Contractor** could have discovered such, the **Contractor** shall bear all costs arising therefrom. The **Contractor** shall be liable to the **City** for failure to report any conflict, error, ambiguity, or discrepancy of which it knew or should have known.

2.1.3. Field Measurements. The **Contractor** shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to the **Contractor** with the Contract Documents before commencing activities. Errors, inconsistencies, or omissions discovered shall be reported to the **Design Professional** at once.

2.1.4. Statutory Provisions. The **City** and the **Contractor** recognize that other rights duties and obligations with respect to public construction contracts are provided for by statute, notwithstanding the fact that they may not be provided for in the Contract Documents. In case of conflict between the statutory provisions and other provisions of the Contract Documents and the provisions of any applicable statute, the statutory provisions shall govern.

2.1.5. Voided or Unlawful Provisions. In the event any provision in the Contract is voided or deemed unlawful, such provision shall be deleted without affecting the remainder of the Contract.

2.2. Execution.

2.2.1. Execution of the Agreement by the **Contractor** is a representation that the **Contractor** has visited the Site, become familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

2.3. Intent.

2.3.1. Entire Agreement. The Contract Documents comprise the entire agreement between the **City** and the **Contractor** concerning the Work. The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the **Contractor**. The Contract Documents are complementary; what is required by one shall be as binding as if required by all. Performance by the **Contractor** shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the intended results. All Work mentioned or indicated in the Contract Documents shall be performed by the **Contractor** as part of this Contract unless it is specifically indicated in the Contract Documents that such Work is to be done by others.

2.3.2. Statutory Provisions. Each and every provision of law, code, and regulation, required by law to be inserted

in these Contract Documents shall be deemed to be inserted herein, and they shall be read and enforced as though it were included herein, and if through mistake or otherwise, any such provision is not inserted, or if not correctly inserted, then upon the application of either party, the Contract Documents shall forthwith be physically amended to make such insertion.

2.3.3. Functionally Complete Project. It is the intent of the Contract Documents to describe a functionally complete Project. The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the **Contractor**. Any Work, materials, or equipment that may be reasonably inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be furnished and performed by the **Contractor** whether or not specifically called for in the Contract Documents.

2.3.4. Indications or Notations. All indications or notations which apply to one of a number of similar situations, materials, or processes shall be deemed to apply to all such situations, materials, or processes wherever they appear in the Work, except where a contrary result is clearly indicated by the Contract Documents.

2.3.5. Standards or Quality of Materials or Workmanship. Where no explicit quality or standards for materials or workmanship are established for Work, such Work is to be of good quality for the intended use and consistent with the quality of the surrounding Work and of the construction of the Project generally.

2.3.6. Manufactured Products. All manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the manufacturer's written or printed directions and instructions unless otherwise indicated in the Contract Documents.

2.3.7. Mechanical, Electrical, and Fire Protection Plans. The mechanical, electrical, and fire protection Plans are diagrammatic only and are not intended to show the alignment, physical locations, or configurations of such Work. Such Work shall be installed without additional cost to the **City** to clear all obstructions, permit proper clearances for the Work of other trades, and present an orderly appearance where exposed. Prior to beginning such Work, the **Contractor** shall prepare Coordination Drawings and demonstrate to the **Design Professional's** satisfaction that the installations will comply with the preceding sentence. The **Contractor** shall be solely liable and responsible for any costs and/or delays resulting from the **Contractor's** failure to prepare such Coordination Drawings.

2.3.8. Locations of Fixtures and Outlets. Exact locations of fixtures and outlets shall be obtained from the **Design Professional** as provided in Article 5 before the Work is roughed in. Work installed without such information from the **Design Professional** shall be relocated at the **Contractor's** expense.

2.3.9. Tests. When test boring or soil test information are included with the Contract Documents or otherwise made available to the **Contractor** and such test boring or soil test information was obtained by the **City** for use by the **Design Professional** in the design of the Project or Work, the **City** does not hold out such information to the **Contractor** as an accurate or approximate indication of subsurface conditions, and no claim for extra cost of extension of time resulting from a reliance by the **Contractor** on such information shall be allowed except as otherwise provided herein. Any such reports are not part of the Contract Documents.

2.3.10. Joining Work. Where the Work is to fit with existing conditions or work to be performed by others, the **Contractor** shall fully and completely join the Work with such conditions or work, unless otherwise specified.

2.4. Organization.

2.4.1. Except as provided in M.G.L. c. 149, §44F, the organization of the Specifications into divisions, sections, and articles, and the arrangement of Plans shall not control the **Contractor** in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

2.5. References.

2.5.1. Where codes, manuals, specifications, standards, requirements and publications of public and private bodies are referred to in the Contract Documents whether specifically or by implication, references shall be understood to be to the latest revision prior to the date of receiving bids, except where otherwise indicated. Where statutes are referred to in the Contract Documents whether specifically or by implication, references shall be understood to be to the latest revision.

2.5.2. References herein to particular paragraphs or Articles are solely to facilitate finding additional information with regard to the specific matters and are not to be construed in any way as limiting the possible paragraphs and Articles in which such matters may be found elsewhere in this document.

2.6. Reuse of Design Professional's Written Instruments.

2.6.1. Neither the **Contractor** nor any Subcontractor or Supplier shall have or acquire any title to or ownership rights in any of the Plans, Specifications, or other documents prepared by the **Design Professional** and shall not reuse any of such Plans, Specifications, or other documents without prior written consent of the **City** and the **Design Professional**.

2.7. Written Material of the Contractor.

2.7.1. All written material prepared or collected by the **Contractor** in the course of completing the Work shall be the exclusive property of the **City** and shall not be used by the **Contractor** for any purpose other than the purpose of this Contract.

2.8. Modifying Words.

2.8.1. In the interest of simplicity, modifying words such as "all" and "any" may be omitted, but the fact that such words may be absent from one sentence and appear in another is not intended to affect the interpretation of either statement.

2.9. Use of Certain Words and Terms.

2.9.1. Whenever in the Contract Documents the terms "as ordered," "as directed," "as required," "as allowed," "as approved," or terms of like effect or import are used, or the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe a requirement, direction, review, or judgment of the **City** or of the **Design Professional** as to the Work, it is intended that such requirement, direction, review, or judgment will be solely to evaluate, in general, the completed Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise).

2.9.2. The use of any such term or adjective shall not be effective to change the duties and responsibilities of the **City** or the **Design Professional** from those assigned in the Contract Documents or to assign any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of the Contract Documents.

2.9.3. When the words "Contractor," "Subcontractor," "Sub-subcontractor," and "Supplier" are used, they are intended to include their employees and agents, unless otherwise specified.

2.10. Modification of the Contract Documents.

2.10.1. Major Modifications. Major Modifications may affect the Contract Sum or the Contract Time. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways, all of which must contain a written endorsement by the **City**:

2.10.1.1. a formal written amendment;

2.10.1.2. a Change Order;

2.10.1.3. a **Construction Change** Directive; or

2.10.1.4. the **Design Professional's** written interpretation, clarification, or decision.

2.10.2. Minor Modifications. Minor modifications do not affect the Contract Sum or the Contract Time. The requirements of the Contract Documents may be supplemented and minor variations and deviations of the Work may be authorized in one or more of the following ways:

2.10.2.1. a Field Order; or

2.10.2.2. the **Design Professional's** approval of a Shop Drawing or Sample.

ARTICLE 3 THE CITY

3.1. Signatory.

3.1.1. All documents which require a signature or an endorsement by the **City** must be signed by the Mayor in order to be deemed ratified by the **City**.

3.2. Requirements to Provide Documents.

3.2.1. To the extent they are available, the **City** shall furnish surveys describing physical characteristics, legal limitations, and utility locations for the site of the Project, and a legal description of the Site.

3.2.2. The City shall obtain and pay for necessary approvals, easements, assessments, and charges that are customarily secured prior to the execution of the Contract.

3.2.3. The City shall furnish information or services required of the City hereunder with reasonable promptness after receipt from the Contractor of a written request for such information or services.

3.2.4. The City shall provide the Contractor, at no charge, such copies of the Project Manual as are reasonably necessary for the execution of the Work.

3.3. Clerk of the Works.

3.3.1. The City may engage a Clerk of the Works for this Project, in which case the City shall, upon request of the Contractor, provide the Contractor with a written statement of the duties, responsibilities, and limitations of authority of such Clerk of the Works. Except as expressly set forth in such written statement, the Clerk of the Works shall have no authority to approve Work, to approve Change Orders, or to exercise any of the power and authority of the City or the Design Professional. The Clerk of the Works shall observe the Contractor's operations and construction activities for compliance with the Plans and Specifications. The Clerk of the Works shall have access to all areas of the Project at all times. The Contractor shall fully cooperate with the Clerk of the Works in the performance of the Clerk's duties.

3.4. City's Right to Perform Construction and to Award Separate Contracts.

3.4.1. The City reserves the right to perform construction or operations at the Site with its own forces or others. If the Contractor claims that a delay or additional cost is involved because of such action by the City, the Contractor shall make such Claim as provided elsewhere in the Contract Documents.

3.4.2. When the separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate City-Contractor Agreement.

3.4.3. The City shall provide for coordination of the activities of the City's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall afford each other person access to the Site and shall properly coordinate its Work with that of the persons performing other work. The Contractor shall participate with other separate contractors and the City in reviewing their construction schedules when directed to do so. The Contractor shall make any revisions to the construction schedules deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors, and the City until subsequently revised.

3.5. Limitations on the City's Responsibilities.

3.5.1. The City shall not supervise, direct, or have control or authority over, nor be responsible for the Contractor's means, methods, techniques, sequences, or procedures of construction or the safety precautions and programs incident thereto, or for any failure of the Contractor to comply with laws, codes and regulations applicable to the furnishing or performance of the Work. The City will not be responsible for the Contractor's failure to perform or furnish the Work in accordance with the Contract Documents. The City is not responsible for the acts or omissions of the Contractor, any Subcontractor, Supplier, or anyone for whose acts the Contractor, any Subcontractor or Suppliers may be liable.

3.5.2. The City's authority to review any of the Contractor's progress schedules, or its decision to raise or not to raise any objections about such schedules shall not impose on the City any responsibility for the timing, planning, scheduling, or execution of the Work, nor in any way give rise to any duty or responsibility on the part of the City to exercise this authority for the benefit of the Contractor, any Subcontractor or Supplier or any other party.

3.5.3. The City's decision to raise or not to raise objections with regard to any aspects of the Contractor's insurance shall in no way give rise to any duty or responsibility on the part of the City to or for the benefit of the Contractor, any Subcontractor, any Supplier, or any other party.

3.6. Reservation of Rights.

3.6.1. The City reserves the right to correct at any time any error in any progress payment that may have been made.

3.6.2. Should defective Work be discovered subsequent to final payment, the City reserves the right to make a claim and recover all costs and professional fees associated therewith, including the cost of removing and/or replacing the defective Work.

3.7. Waivers.

3.7.1. All waivers by the City are valid only to the extent that they are signed by the City. Any such waivers pertain only to the specific matter contained in the waiver and not to any similar, subsequent matters.

ARTICLE 4 THE DESIGN PROFESSIONAL

4.1. City's Representative.

4.1.1. The Design Professional is the City's representative (1) during construction, (2) until final payment is due, and (3) with the City's concurrence, from time to time during the correction period described in Article 10. The Design Professional will advise and consult with the City. The Design Professional will have authority to act on behalf of the City only to the extent provided in the Contract Documents, unless otherwise modified by a written instrument in accordance with other provisions of the Contract.

4.1.2. The duties, responsibilities, and the limitations of authority of the Design Professional as the City's representative during construction are set forth in the Contract Documents and shall not be extended without the written consent of the City and the Design Professional.

4.2. Administration of the Contract.

4.2.1. The Design Professional will provide administration of the Contract as described in the Contract Documents, unless the City has engaged a construction manager.

4.3. Visits to the Site.

4.3.1. The Design Professional will visit the site at intervals appropriate to the stage of construction to become generally familiar with the progress and quality of the completed Work and to determine in general if the Work is being performed in a manner indicating that the Work, when completed, will be in accordance with the Contract Documents. However, the Design Professional will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. On the basis of on-site observations as an architect, engineer, or landscape architect, the Design Professional will keep the City informed of progress of the Work in writing and will endeavor to guard the City against defects and deficiencies in the Work.

4.4. Communications Facilitating Contract Administration.

4.4.1. Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the City and the Contractor shall endeavor to communicate through the Design Professional. Communications by and with the Design Professional's consultants shall be through the Design Professional. Communications by and with Subcontractors and Suppliers shall be through the Contractor. Communications by and with City employees and separate contractors shall be through the City.

4.4.2. When it deems it necessary or expedient, the City may communicate directly with the Contractor, any Subcontractors, Suppliers, or consultants.

4.5. Certification of Applications for Payment.

4.5.1. Based on the Design Professional's observations and evaluations of the Contractor's applications for payment, the Design Professional will review and certify the amounts due the Contractor and will issue certificates for payment in such amounts.

4.6. Rejection of Work.

4.6.1. The Design Professional will have authority to reject or disapprove Work (1) that does not conform to the Contract Documents; (2) that the Design Professional believes to be defective; and (3) that the Design Professional believes will not produce a completed Project conforming to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Whenever the Design Professional considers it necessary or advisable for implementation of the intent of the Contract Documents, the Design Professional will have authority to require additional inspection or testing of the Work in accordance with Article 9, whether or not such Work is fabricated, installed, or completed. However, neither this authority of the Design Professional nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Design Professional to the Contractor, Subcontractors, Suppliers, or other persons performing portions of the Work.

4.7. Review of Submittals.

4.7.1. The Design Professional will review or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents and only to the extent that the Design Professional believes desirable to protect the City's interest. The Design Professional's action will be taken with reasonable promptness, while allowing sufficient time in the Design Professional's professional judgment to permit adequate review, taking into account the

time periods set forth in the latest schedule prepared by the **Contractor** and approved by the **Design Professional**. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the **Contractor** as required by the Contract Documents. The **Design Professional's** review of the **Contractor's** submittals shall not relieve the **Contractor** of the obligations under Article 5. The **Design Professional's** review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The **Design Professional's** approval of a specific item shall not indicate approval of an assembly of which the item is a component. After the rejection of the second resubmittal of any one Submittal, the **Contractor** shall bear the cost of the review of each subsequent resubmittal.

4.8. Preparation of Change Orders and Construction Change Directives.

4.8.1. The **Design Professional** will prepare Change Orders and **Construction Change** Directives and may authorize minor Modifications in the Work as provided in Article 11.

4.9. Inspections.

4.9.1. The **Design Professional** will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; will receive and forward to the **City** for the **City's** review and records written warranties and related documents required by the Contract and assembled by the **Contractor**; and will issue a final certificate for payment upon the **Contractor's** compliance with all of the requirements of the Contract Documents.

4.10. Interpretations, Clarifications, and Decisions.

4.10.1. The **Design Professional** will interpret and decide matters concerning performance under and requirements of the Contract Documents on written request of either the **City** or the **Contractor**. The **Design Professional's** response to such requests will be made with reasonable promptness and within the time set forth in the Agreement between the **City** and the **Design Professional**. Any such written interpretations, clarifications, and decisions shall be binding on the **Contractor**.

4.10.2. Interpretations, clarifications, and decisions of the **Design Professional** will be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings. The **Design Professional** will not be liable to the **Contractor**, any Subcontractor, or Supplier for results of interpretations, clarifications, or decisions so rendered in good faith.

4.10.3. The **Design Professional** may, as the **Design Professional** judges desirable, issue additional drawings or instructions indicating in greater detail the construction or design of the various parts of the Work; such drawings or instructions may be effected by a Field Order or other notice to the **Contractor**, and provided such drawings or instructions are reasonably consistent with the previously existing Contract Documents, the Work shall be executed in accordance with such additional drawings or instructions without any additional cost or an extension of the Contract Time.

4.10.4. The **Design Professional's** decisions on matters relating to aesthetic effect must be consistent with the **City's** and will be final.

4.11. Limitation on the Design Professional's Responsibilities.

4.11.1. Neither the **Design Professional's** authority to act under the provisions of the Contract Documents nor any decision made by the **Design Professional** in good faith to exercise or not to exercise such authority shall give rise to any duty or responsibility of the **Design Professional** to the **Contractor**, any Subcontractor, any Supplier, any surety for any of them or any other person.

4.11.2. The **Design Professional** will not have control over or charge of and will not be responsible for construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the Work, since these are solely the **Contractor's** responsibility as provided in Article 5. The **Design Professional** will not be responsible for the **Contractor's** failure to carry out the Work in accordance with the Contract Documents. The **Design Professional** will not have control over or charge of and will not be responsible for acts or omissions of the **Contractor**, Subcontractors, Suppliers, or of any other persons performing portions of the Work.

**ARTICLE 5
THE CONTRACTOR**

5.1. Relationship with the City.

5.1.1. The **Contractor** is an independent contractor and not an employee of the **City**. The **Contractor** is engaged by virtue of the Contract to perform only those services contained therein. The **Contractor** is not authorized to contract on behalf of the **City** or to incur any liability on the part of the **City**.

5.2. Code of Conduct.

5.2.1. M.G.L. c. 268A establishes standards of conduct for officials and employees of the **City**. The **Contractor** shall familiarize itself with the statute and act accordingly.

5.3. Quality Assurance.

5.3.1. The **Contractor** shall be responsible for ensuring that it, all Subcontractors, Suppliers, and all persons employed to do the Work under the Contract Documents perform in a professional manner, provide a high quality of service and Work, and perform in accordance with the Contract Documents.

5.4. Supervision.

5.4.1. Competence and Efficiency. The **Contractor** shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills, attention and expertise as may be necessary to perform the Work in accordance with the Contract Documents.

5.4.2. Construction Means, Methods, Techniques, Etc. The **Contractor** shall be solely responsible for and have control over construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the Work under the Contract. Where the Contract Documents refer to particular construction means, methods, techniques, sequences, or procedures or indicate or imply that such are to be used in the Work, such mention is intended only to indicate that the operations of the **Contractor** shall be such as to produce at least the quality of Work implied by the operations described. The actual determination of whether or not the described operations may be safely and suitably employed on the Work shall be the responsibility of the **Contractor**, who shall notify the **Design Professional** in writing, prior to implementation, of the actual means, methods, techniques, sequences, or procedures which will be employed on the Work, if these differ from those mentioned in the Contract Documents. All loss, damage, liability or cost of correcting defective work arising from the employment of any construction means, methods, techniques, sequences, or procedures shall be borne by the **Contractor**, notwithstanding that such construction means, methods, techniques, sequences, or procedures are referred to, indicated or implied by the Contract Documents, unless the **Contractor** has given timely notice to the **City** and the **Design Professional** in writing that such means, methods, techniques, sequences, or procedures are not safe or suitable, and the **City** has then instructed the **Contractor** in writing to proceed at the **City's** risk.

5.4.3. Variance between the Contract Documents and Statutes, Ordinances, Codes, Rules, and Regulations. The **Contractor** shall promptly notify the **Design Professional** and the **City** in writing of any variances between the Contract Documents and statutes, ordinances, codes, rules, and regulations. If the **Contractor**, without written notice to the **Design Professional** and the **City**, performs Work knowing that it is contrary to statutes, ordinances, codes, rules, and regulations, the **Contractor** shall assume full responsibility for such Work and shall bear the costs associated therewith, i.e., replacement, repairs, removal, and fines.

5.4.4. Acts and Omissions. The **Contractor** shall be responsible to the **City** for the acts and omissions of all persons performing or supplying the Work.

5.4.5. Inspections. The **Contractor** shall be responsible for inspection of portions of Work already performed under this Contract to determine whether such portions are in proper condition to receive subsequent Work.

5.5. Personnel.

5.5.1. Suitability. The **Contractor** shall provide competent, properly licensed and/or certified, suitably qualified, and reliable personnel to perform the Work required by the Contract Documents. The **Contractor** shall enforce strict discipline and maintain good order at the site at all times. The **Contractor** shall not employ any Subcontractor, Supplier, or other person, whether initially or as a substitute, against whom the **City** may have reasonable objection. Acceptance of any Subcontractor or other person by the **City** shall not constitute a waiver of any right of the **City** to reject defective Work.

5.5.2. Sexual Harassment. Sexual harassment is an unlawful practice under M.G.L. c. 151B. The **Contractor**, Subcontractors, and all other persons responsible for any portion of the Work shall refrain from engaging in sexual harassment. The **Contractor** shall be responsible for any acts of sexual harassment committed by any persons responsible for any portion of the Work. The **Contractor** shall take appropriate action against any such individuals.

5.5.3. Weapons and Illegal Drugs. No weapons or illegal drugs are permitted on the Site. It is the responsibility of the **Contractor** to ensure that no weapons or illegal drugs are brought to the Site.

5.5.4. Maximum Work Day and Work Week. (*Reference:* M.G.L. c. 149, §§30 and 34;). No laborer, worker, mechanic, foreperson or inspector working within this Commonwealth in the employ of the **Contractor**, Subcontractor or other person doing or contracting to do the whole or part of the work contemplated by the Contract, shall be required or permitted to work more than eight (8) hours in any one day or more than forty-eight (48) hours in any one week, or more than six (6) days in any one week, except in cases of emergency.

5.5.5. Lodging. (Reference: M.G.L. c. 149, §25;). Every employee under this Contract shall lodge, board and trade where and with whom he or she elects, and neither the **Contractor** nor its agents or employees shall, either directly or indirectly, require as a condition of the employment of any person that the employee shall lodge, board or trade at a particular place or with a particular person.

5.5.6. Wage Rates. (Reference: M.G.L. c. 149, §27). Mechanics and apprentices, teamsters, chauffeurs and laborers performing Work shall be paid no less than the minimum rate of wages included in the bid documents and the Project Manual and which are made part of the Contract. They shall continue to be the minimum rate of wages for said employees during the life of the Contract. The **Contractor** shall keep a legible copy of the wage rates posted in a conspicuous place at the site during the life of the Contract. These rates of wages shall include payments by employers to health and welfare plans, pension plans and supplementary unemployment benefit plans as provided in M.G.L. c. 149, §26;, and such payments shall be considered as payments to persons under M.G.L. c. 149, §27 performing work as therein provided. If the **Contractor** does not make payments to a health and welfare plan, a pension plan and a supplementary unemployment benefit plan, where such payments are included in the rates of wages, the **Contractor** shall pay the amount of said payments directly to each employee engaged in the Work. If the **Contractor** pays less than the rate of wages, including payments to health and welfare funds and pension funds, or the equivalent payments in wages to any person performing Work within the classifications as determined by the Commissioner of Labor and Industries, and if the **Contractor** takes or receives for its own use or the use of any other person, as a rebate, refund or gratuity, or in any other guise, any part or portion of the wages, including payments to health and welfare funds and pension funds, or the equivalent payment in wages, paid to such person for Work done or service rendered on the Project, the **Contractor** will be subject to the penalties set forth in M.G.L. c. 149, §27. Notwithstanding the foregoing and the requirements of 5.5.7.1 and 5.5.7.2 below, if the Contract is federally funded, federal labor standards apply, including Davis Bacon minimum wage rates and payroll reporting requirements. See the "Federal Requirements" section at the end of these contract documents.

5.5.7. Payroll Records of Employees. (Reference: M.G.L. c. 149, §27B;). The **Contractor** and all Subcontractors who are subject to M.G.L. c. 149, §§27 and 27A shall keep a true and accurate record of all mechanics and apprentices, teamsters, chauffeurs, and laborers performing Work showing the name, address and occupational classification of each such employee, the hours worked by and the wages paid to all such employees. The **Contractor** and the Subcontractors shall submit a copy of said record to the **City** on a weekly basis.

5.5.7.1. (Reference: M.G.L. c. 149, §27B;). The **Contractor** and all Subcontractors who are subject to M.G.L. c. 149, §§27 and 27A shall preserve their payroll records for a period of three (3) years from the date of completion of the Contract.

5.5.7.2. (Reference: M.G.L. c. 149, §27B). The **Contractor** and all Subcontractors who are subject to M.G.L. c. 149, §§27 and 27A shall furnish to the Commissioner of Labor and Industries and the **City** within fifteen (15) days after completion of their portion of the Work a statement executed by the **Contractor** or Subcontractor or by any authorized officer or employee of the **Contractor** or Subcontractor who supervises the payment of wages in the form found in M.G.L. c.149, §27B.

5.6. Superintendence.

5.6.1. Employment of a Superintendent. The **Contractor** shall employ a competent, properly licensed superintendent, reasonably acceptable to the **City**, and necessary assistants who shall be in attendance at the Site full time during the progress of the Work until the date of Substantial Completion and for such additional time thereafter as the **Design Professional** or the **City** may determine to be necessary for the expeditious completion of the Work, including final completion. If continually in the employ of the Contractor, the same Superintendent shall be assigned to this project.

5.6.2. Removal/Replacement of a Superintendent. The **Contractor** shall remove the superintendent if requested to do so in writing by the **City** and shall promptly replace such superintendent with a competent person reasonably acceptable to the **City**. The superintendent shall represent the **Contractor**, and communications given to the superintendent shall be as binding as if given to the **Contractor**. The **Contractor** shall not replace the superintendent without written notice to the **City** and the **Design Professional**.

5.6.3. Registered Professional Engineer or Registered Land Surveyor. The **Contractor** shall retain a competent Registered Professional Engineer or Registered Land Surveyor, acceptable to the **Engineer**, who shall establish the exterior lines and required elevations of all buildings and structures to be erected on the site and shall establish sufficient lines and grades for the construction of associated Work such as, but not limited to, roads, utilities, and site grading. The Engineer or Land Surveyor shall certify as to the actual location of the constructed facilities in relation to property lines, building lines, easements, and other restrictive boundaries.

5.6.4. Building Grades, Lines, Etc.; The **Contractor** shall establish the building grades; lines; levels; and column, wall and partition lines required by the various Subcontractors in laying out their Work.

5.6.5. Coordination and Supervision. The **Contractor** shall coordinate and supervise the Work performed by Subcontractors to the end that the Work is carried out without conflict between trades and so that no trade, at any time, causes delay to the general progress of the Work. The **Contractor** and all Subcontractors shall at all times afford each trade, any separate contractor, or the **City**, every reasonable opportunity for the installation of Work and the storage of materials.

5.6.6. Job Meetings. There shall be job meetings held on a weekly basis, or more often if required by the **City**. The **Contractor** shall arrange for and attend weekly job meetings with the **Design Professional** and such other persons as the **Design Professional** may from time to time wish to have present. The **Contractor** shall be represented by a principal, project manager, general superintendent or other authorized main office representative, as well as by the **Contractor's** own superintendent. An authorized representative of any Subcontractor or Sub-subcontractor shall attend such meetings if the representative's presence is requested by the **Design Professional**. Such representatives shall be empowered to make binding commitments on all matters to be discussed at such meetings, including costs, payments, Change Orders, time schedules and workforce power. Any notices required under the Contract may be served on such representatives.

5.7. Materials, Labor, Equipment, Etc.

5.7.1. Provision of. Unless otherwise provided in the Contract Documents, the **Contractor** shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up, and completion of the Work. The Contractor shall and will, in good workmanlike manner, do and perform all work and furnish all supplies and materials, machinery, equipment, facilities and means, except as herein otherwise expressly specified, necessary or proper to perform and complete all the work required by this contract, within the time herein specified, in accordance with the provisions of this contract and said specifications and in accordance with the plans and drawings, and in accordance with the directions of the Design Professional or CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT) as given from time to time during the progress of the work. He shall furnish, erect, maintain and remove such construction plant and such temporary works as may be required. The Contractor shall observe, comply with and be subject to all terms, conditions, requirements and limitations of the contract and specifications, and shall do, carry on and complete the entire work to the satisfaction of the Design Professional and CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT).

5.7.1.1. The Contractor shall furnish, install and/or maintain ample sanitary facilities for the workmen. As the needs arise, a sufficient number of enclosed temporary toilets shall be conveniently placed as required by the sanitary codes of the State and Local Government. Drinking water shall be provided from an approved source, so piped or transported as to keep it safe and fresh and served from single service containers or satisfactory types of sanitary drinking stands or fountains. All such facilities and services shall be furnished in strict accordance with existing and governing health regulations. Nothing in this Section shall be construed as forbidding the use of facilities available in existing buildings on the job site if they meet the above requirements and the use of them will not interfere with the progress of the work.

5.7.2. Quality and Use of. All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. If required by the **Design Professional**, the **Contractor** shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise provided in the Contract Documents.

5.7.3. Discrepancies or Defects. If the **Contractor** is unable to perform its Work because of discrepancies or defects in the work of the **City's** own forces or of a separate contractor, the **Contractor** shall immediately notify the **Design Professional** and the **City** in writing of the conditions that render unable to so perform. Failure to notify the **Design Professional** constitutes an acknowledgment and acceptance of the other work as being fit and proper for integration with the **Contractor's** Work except for latent or non-apparent defects and deficiencies in the other work.

5.8. Contractor's Management and Financial Statement Requirements. (Reference: M.G.L. c. 30, §39R)

5.8.1. The words defined herein shall have the meaning stated below whenever they appear in this Paragraph:

5.8.1.1. "Contractor" means any person, corporation, partnership, joint venture, sole proprietorship, or other entity awarded a contract pursuant to M.G.L. c.149, §44A-H or M.G.L. c. 30, §39M, inclusive.

5.8.1.2. "Contract" means any contract awarded or executed pursuant to M.G.L. c. 149, §44A-H or M.G.L. c. 30, §39M, which is for an amount or estimate amount that exceed the dollar amount set forth in M.G.L. c. 30, §39R.

5.8.1.3. "Records" means books of original entry, accounts, checks, bank statements and all other banking documents, correspondence, memoranda, invoices, computer printouts, tapes, discs, papers and other documents or transcribed information of any type, whether expressed in ordinary or machine language.

5.8.1.4. "Independent Certified Public Accountant" means a person duly registered in good standing and entitled to practice as a certified public accountant under the laws of the place of his/her residence or principal office and who is

in fact independent. In determining whether an accountant is independent with respect to a particular person, appropriate consideration should be given to all relationships between the accountant and that person or any affiliate thereof. Determination of an accountant's independence shall not be confined to the relationships existing in connection with the filing of reports with the City.

5.8.1.5. "Audit," when used in regard to financial statement, means an examination of records by an independent certified public accountant in accordance with generally accepted accounting principles and auditing standards for the purpose of expressing a certified opinion thereon, or, in the alternative, a qualified opinion or a declination to express an opinion for stated reasons.

5.8.1.6. "Accountant's Report," when used in regard to financial statements, means a document in which an independent certified accountant indicates the scope of the audit which s/he has made and sets forth his/her opinion regarding the financial statements taken as a whole with listing of noted exceptions and qualifications, or an assertion to the effect that an overall opinion cannot be expressed. When an overall opinion cannot be expressed the reason therefor shall be stated. An accountant's report shall include as part thereof a signed statement by the responsible corporate officer attesting that management has fully disclosed all material facts to the independent certified public accountant, and that the audited financial statement is a true and complete statement of the financial condition of the contractor.

5.8.1.7. "Management," when used herein, means the chief executive officers, partners, principals or other person or persons primarily responsible for the financial and operational policies and practices of the Contractor.

5.8.1.8. Accounting terms, unless otherwise defined herein shall have a meaning in accordance with generally accepted accounting principles and auditing standards.

5.8.2. The Contractor shall make, and keep for at least six (6) years after final payment, books, Records, and accounts that in reasonable detail accurately and fairly reflect the transactions and dispositions of the Contractor.

5.8.2.1 Federal Requirements: The Contractor shall permit the City, HUD and/or any other administering agency named herein, the Comptroller General of the United States, or any of their duly authorized representatives, to have access to any books, documents, papers, and records of the Contractor which are directly pertinent to a specific HUD program for the purpose of making audits, examinations, excerpts, and transcriptions.

5.8.3. Until the expiration of six (6) years after final payment, the Office of the Inspector General, and the Deputy Commissioner of the Division of Capital Asset Management shall have the right to examine any books, documents, papers or Records of the Contractor or of its Subcontractors that directly pertain to, and involve transactions relating to, the Contractor or its Subcontractors.

5.8.4. The Contractor shall describe any change in the method of maintaining Records or recording transactions which materially affect any statements filed with the City, including in its description the date of the change and reasons therefor, and shall accompany said description with a letter from the Contractor's Independent Certified Public Accountant approving or otherwise commenting on the changes.

5.8.5. The Contractor shall file a Statement of Management on internal accounting controls as set forth below prior to the execution of the Contract.

5.8.6. The Contractor shall file prior to the execution of the contract and shall continue to file annually, an Audited Financial Statement for the most recent completed fiscal year as set forth below.

5.8.7. The Contractor shall file with the City a Statement of Management as to whether the system of internal accounting controls of the Contractor and its subsidiaries reasonably assures that:

5.8.7.1. transactions are executed in accordance with Management's general and specific authorization;

5.8.7.2. transactions are recorded as necessary to permit preparation of financial statements in conformity with generally accepted accounting principles, and to maintain accountability for assets;

5.8.7.3. access to assets is permitted only in accordance with Management's general or specific authorization;

and
5.8.7.4. the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action is taken with respect to any difference.

5.8.7.5. The Contractor shall also file with the City a statement prepared and signed by an Independent Certified Public Accountant stating that s/he has examined the Statement of Management on internal accounting controls, and expressing an opinion as to:

5.8.7.5.1. whether the representation of Management in response to this paragraph and paragraphs 5.8.2. through 5.8.6 above are consistent with the result of Management's evaluation of the system of internal accounting controls; and

5.8.7.5.2. whether such representations of Management are, in addition, reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the applicant's financial statements.

5.8.8. The Contractor shall annually file with the Commissioner of the Division of Capital Asset Management during the term of the contract a financial statement prepared by an Independent Certified Public Accountant on the basis of an Audit by such accountant. The final statement filed shall include the date of final payment. All statements shall be accompanied by an accountant's report. Such statements shall be made available to the City upon request.

5.8.9. The City's Contracting Department, its authorized representative and agents and the HUD Representative for the Secretary shall, at all times have access to and be permitted to observe and review all work materials, equipment, payrolls, personnel records, employment conditions, material invoices, and other relevant data and records pertaining to this Contract, provided, however, that all instructions and approval with respect to the work will be given to the Contractor only by CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT) through its authorized representatives or agents. Records and statements required to be made, kept or filed under the provisions of this section shall not be public records as defined in G.L. 4, §7 or equivalent federal legislation. They shall not be made available to the public, but shall be available only to the governmental authorities named herein.

5.9. Taxes.

5.9.1 The Contractor shall pay all sales, consumer, use, and other similar taxes for the Work or portions thereof which are provided by the Contractor which are legally enacted when bids are received, whether or not yet effective or merely scheduled to go into effect. However, the Contractor shall not pay, and the City shall not reimburse or pay the Contractor for, any sales taxes for building supplies or materials for which an exemption is provided in M.G.L. c. 64H, §6(f). The City's tax exemption number to be used by the Contractor in this regard is E04-600-1414.

5.10. Permits, Licenses, and Fees.

5.10.1 Unless otherwise provided, the Contractor shall obtain and pay the fees for all permits, licenses, and inspections that are necessary for the proper execution and completion of the Work and which are customarily secured after execution of the Contract and which are legally required. All fees for permits, licenses, and inspections required by any City department shall be waived. Unless otherwise agreed by the Awarding Authority in writing, the Contractor shall, prior to commencement of the work, (i) meet with the City of Somerville Inspectional Services Department to determine what permits are needed for the work; (ii) obtain all such permits; and (iii) provide copies of such permits to the Awarding Authority. Permits shall include, without limitation, demolition, foundation, digsafe, and building permits; permits for removal, sealing up, or installation of utilities, including gas, electrical, water and sewer; and permits for obstructing public streets and sidewalks.

5.11. Notices Required By Statutes, Ordinances, Codes, Rules, Regulations, and Orders of the City.

5.11.1 The Contractor shall give notices required by statutes, ordinances, codes, rules, regulations, and orders of the City bearing on performance of the Work.

5.12. Additional Information from Design Professional.

5.12.1. The Contractor shall perform the Work in accordance with the Contract Documents and submittals approved pursuant to Article 4.

5.12.2. The Contractor shall give the Design Professional timely notice of any additional Plans, Specifications, or instructions required to define the Work in greater detail, or to permit the proper progress of the Work.

5.12.3. The Contractor shall not proceed with any Work not clearly and consistently defined in detail in the Contract Documents, but shall request additional drawings or instructions from the Design Professional as provided in the previous Paragraph. If the Contractor proceeds with such Work without obtaining further drawings, Specifications, or instructions, the Contractor shall correct Work incorrectly done at the Contractor's own expense.

5.13. "Or equal."

5.13.1. Requirements for Substitutions. (Reference: M.G.L. c. 30, §39M(b).) Where products or materials are prescribed by manufacturer name, trade name, or catalog reference, the words "or approved equal" shall be understood to follow. An item shall be considered equal to the item so named or described if, in the opinion of the Design Professional:

5.13.1.1. it is at least equal in quality, durability, appearance, strength, and design;

5.13.1.2. it performs at least equally the function imposed by the general design for the Work;

5.13.1.3. it conforms substantially, even with deviations, to the detailed requirements for the items as indicated by the Specifications.

5.13.2. Net Savings. No proposed substitution will be permitted unless the Contractor certifies that the proposed substitution will yield a net savings to the City and will not extend the Contract Time.

5.13.3. Contractor's Expense. Any structural or mechanical changes made necessary to accommodate substituted

equipment under this paragraph (including but not limited to engineering fees) shall be at the expense of the **Contractor** or **Subcontractor** responsible for the Work item.

5.13.3.1. Any additional cost, or any loss or damage arising from the substitution of any material or any method for those originally specified shall be borne by the **Contractor**, notwithstanding approval or acceptance of such substitution by the **City** or the **Design Professional**, unless such substitution was made at the written request or direction of the **City** or the **Design Professional**.

5.13.3.2. All data to be provided by the **Contractor** in support of any proposed "or equal" or substitute item will be at the **Contractor's** expense.

5.13.4. Meeting Requirements. The **Contractor** shall be responsible for determining that all materials furnished for the Work meet all requirements of the Contract Documents. The **Design Professional** may require the **Contractor** to produce reasonable evidence that a material meets such requirements, such as certified reports of past tests by qualified testing laboratories, reports of studies by qualified experts, or other evidence which, in the opinion of the **Design Professional**, would lead to a reasonable certainty that any material used, or proposed to be used, in the Work meets the requirements of the Contract Documents. All such data shall be furnished at the **Contractor's** expense. This provision shall not require the **Contractor** to pay for periodic testing of different batches of the same material, unless such testing is specifically required by the Contract Documents to be performed at the **Contractor's** expense.

5.13.5. Named Manufacturer's Product. In all cases in which a manufacturer's name, trade name, or other proprietary designation is used in connection with materials or articles to be furnished under this Contract, whether or not the phrase "or equal" is used after such name, the **Contractor** shall furnish the product of the name manufacturer(s) without substitution, unless a written request for a substitute has been submitted by the **Contractor** and approved in writing by the **Design Professional** as provided in the following paragraph.

5.13.6. Deviations. If the **Contractor** proposes to use a material which while suitable for the intended use, deviates in any way from the detailed requirements of the Contract Documents, the **Contractor** shall inform the **Design Professional** in writing of the nature of such deviations at the time the material is submitted for approval and shall request written approval of the deviation from the requirements of the Contract Documents.

5.13.7. Rejection of Deviations. In requesting approval of deviations or substitutions, the **Contractor** shall provide, upon request, evidence leading to a reasonable certainty that the proposed substitution or deviation will provide a quality of result at least equal to that otherwise attainable. If, in the opinion of the **Design Professional**, the evidence presented by the **Contractor** does not provide a sufficient basis for such reasonable certainty, the **Design Professional** may reject such substitution or deviation without further investigation.

5.13.8. Consistent Character and Quality of Design. The Contract Documents are intended to produce a building of consistent character and quality of design. All components of the building including visible items of mechanical and electrical equipment have been selected to have a coordinated design in relation to the overall appearance of the Project. The **Design Professional** shall judge the design and appearance of proposed substitutes on the basis of their suitability in relation to the overall design of the Project, as well as for their intrinsic merits. The **Design Professional** will not approve as equal to materials specified proposed substitutes that, in the **Design Professional's** opinion, would be out of character, obtrusive, or otherwise inconsistent with the character or quality of design of the Project. In order to permit coordinated design of color and finishes the **Contractor** shall, if required by the **Design Professional**, furnish the substituted material in any color, finish, texture, or pattern which would have been available from the manufacturer originally specified, at no additional cost to the **City**.

5.13.9. Warranty. The warranties provided herein shall be in addition to and not in limitation of any other warranty required by the Contract Documents or otherwise prescribed by law.

5.13.10. Design Professional's Approval. The **Design Professional** will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed, or utilized without the **Design Professional's** prior written acceptance which will be evidenced by either a Change Order or an approved Shop Drawing. The **City** may require the **Contractor** to furnish at the **Contractor's** expense a special performance guarantee or other surety with respect to any "or equal" or substitute. The **Design Professional** will record the time required by the **Design Professional** and its consultants in evaluating substitutes proposed or submitted by the **Contractor** and in making changes in the Contract Documents (or in the provisions of any other direct contract with the **City** for work on the Project) occasioned thereby. Whether or not the **Design Professional** accepts a substitute item so proposed or submitted by the **Contractor**, the **Contractor** shall reimburse the **City** for the charges of the **Design Professional** and its consultants for evaluating each such proposed substitute item.

5.14. Substitute Construction Methods or Procedures.

5.14.1 If a specific means, method, technique, sequence, or procedure of construction is shown or indicated in and expressly required by the Contract Documents, the **Contractor** may furnish or utilize a substitute means, method, technique, sequence or procedure of construction acceptable to the **Design Professional**. The **Contractor** shall submit sufficient information to allow the **Design Professional**, in the **Design Professional's** sole discretion, to determine whether the substitute

proposed is equivalent to that expressly called for by the Contract Documents.

5.15. Contractor's Progress Schedule.

5.15.1. Before Starting Construction. Within ten (10) days after the date of the Notice to Proceed, the **Contractor** shall submit to the **Design Professional** for review:

5.15.1.1. a preliminary progress schedule indicating the times (number of days or dates) for starting and completing the various stages of the Work;

5.15.1.2. a preliminary schedule of Shop Drawing and Sample submittals which will list each required submittal and the times for submitting, reviewing, and processing such submittal; and

5.15.1.3. a refined schedule of values for all of the Work which will include quantities and prices of items aggregating the Contract Sum and will subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

5.15.2. Review of Progress Schedule. At least ten (10) days prior to the commencement of construction, the **Design Professional**, the **Contractor**, and any other appropriate persons will meet to review and discuss the acceptability to the **Design Professional** of the progress schedule. The **Contractor** will have an additional ten (10) days to make corrections and adjustments and to complete and resubmit the schedule. No progress payment shall be made to the **Contractor** until the schedule is submitted to and found acceptable by the **Design Professional** as provided below.

5.15.3. Acceptability of Progress Schedule. The progress schedule will be acceptable to the **Design Professional** if, according to the **Design Professional**, it provides an orderly progression of the Work to completion within any specified time frame, but such acceptance will neither impose on the **Design Professional** responsibility for the sequencing, scheduling, or progress of the Work nor interfere with or relieve the **Contractor** from the **Contractor's** full responsibility therefore. The **Contractor's** schedule of Submittals must be acceptable to the **Design Professional** in providing a workable arrangement for reviewing and processing the required Submittals. The **Contractor's** schedule of values must be acceptable to the **Design Professional** as to form and substance.

5.15.4. Sepia and Copies. After the **Design Professional** has approved the schedule, the **Contractor** shall submit to the **Design Professional** one (1) sepia and four (4) copies bearing the **Contractor's** stamp of approval as a representation to the **City** that the **Contractor** has determined or verified all data on that progress schedule and that the **Contractor**, the Subcontractors and Suppliers have reviewed and coordinated the sequences in that progress schedule with the requirements of the Work.

5.15.5. Adjustment of Schedule. The **Contractor** shall adhere to the established progress schedule which may be adjusted from time to time as follows: the **Contractor** shall submit to the **Design Professional** for acceptance proposed adjustments in the progress schedule that will not change the Contract Time. Such adjustments will conform generally to the progress schedule then in effect and will comply with any provisions of the requirements applicable thereto.

5.15.6. During Construction. The **Contractor** shall submit monthly progress schedules to the **Design Professional**. The schedules shall stay current with the **Contractor's** approach to the Work remaining.

5.15.7. Schedule of Submittals. The **Contractor** shall prepare and keep current, for the **Design Professional's** approval, a schedule of Submittals that is coordinated with the **Contractor's** construction schedule and allows the **Design Professional** reasonable time to review Submittals.

5.16. Project Coordination.

5.16.1. In General. The **Contractor** shall be responsible for the proper coordination of the Work of all of the trades.

5.16.2. Coordination with Subcontractors. The **Contractor** shall coordinate the work of each Subcontractor with the Work of every other Subcontractor whose Work affects the other.

5.16.3. Coordination with the City's Own Forces or Separate Contractors. The **Contractor** shall coordinate its operations with those of the **City's** own forces or separate contractors. The **Contractor** shall provide the **City's** own forces and separate contractors a reasonable opportunity for the handling, unloading and storage of their materials and equipment and execution of their work. The **Contractor** shall connect and coordinate its Work with theirs.

5.16.4. Coordination with Utility Companies. The **Contractor** shall coordinate its operations with all the appropriate utility companies to assure that the utilities required on the Project are available and functioning properly pursuant to the requirements of the Contract Documents.

5.17. Project Photographs.

5.17.1. In General. The **Contractor** shall take, at its own expense, interior and exterior photographs at the site, from different vantages as directed by the **Design Professional** or the **City**, before beginning any Work and thereafter, at a minimum, on the first work day of each month until final completion of the Work, including final Site photos. Photos shall be taken of any

Work that will be buried or concealed while the Work is still exposed. The photographs shall be taken by a skilled commercial photographer. The number of photographs required shall be at the discretion of the City or the Design Professional. One aerial photo shall be required a) prior to commencement of the work and b) at the completion of the work. See Section 01320 – Construction Progress Documentation.

5.17.2. Prints and Digital Media. Within fourteen (14) days after the photographs have been taken, the Contractor shall cause prints to be made and delivered to the City and the Design Professional. All photographs shall be 8” x 10”. Each print shall state the date of the photograph, the name of the Project, the description of the view and the name and address of the photographer. The City shall receive one glossy print of each photo as well as all prints in digital form on compact disc. The Design Professional shall receive one glossy print.

5.17.3. Failure to Comply. Should the Contractor fail to adhere to any requirement set forth in the previous two paragraphs, the City may have the photographs taken at the Contractor's expense or receive a set-off against the Contractor's next application for payment.

5.18. Record Documents and Samples at the Site.

5.18.1 The Contractor shall maintain in a safe place at the site one record copy of all Plans, Specifications, Modifications, Change Orders, Construction Change Directives, Field Orders and written interpretations and clarifications in good order and annotated to show all changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to the Design Professional for reference. Upon completion of the Work, these record documents, Samples and Shop Drawings will be delivered by the Contractor to the Design Professional for the City.

5.19. Submittals.

5.19.1. Purpose. The purpose of Submittals is to demonstrate for those portions of the Work for which Submittals are required the way the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents.

5.19.2. Submittal Procedure. Within ten (10) days from the Notice to Proceed, the Contractor shall submit to the Design Professional a completed Submittals schedule. The Contractor shall review, approve, and submit to the Design Professional Submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the City or of separate contractors. Submittals made by the Contractor that are not required by the Contract Documents may be returned without action. The schedules shall be updated and resubmitted each month. All Submittals will be identified as the Design Professional may require and in the number specified in the General Requirements. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show the Design Professional the materials and equipment that the Contractor proposes to provide and to enable the Design Professional to review the information for the limited purposes stated below.

5.19.3. Samples. The Contractor shall also submit Samples to the Design Professional for review and approval in accordance with said accepted schedule of Submittals. Each Sample will be identified clearly as to material, Supplier, pertinent data such as catalog numbers and the use for which it is intended and otherwise as the Design Professional may require to enable the Design Professional to review the Submittal for the limited purposed stated below. The numbers of each Sample to be submitted will be as specified in the Specifications. Unless otherwise specified in the Specifications, three (3) specimens of each Sample shall be submitted.

5.19.3.1. The Samples shall be of sufficient size to permit proper evaluation of material. Where variations in color or other characteristics are to be expected, samples showing the minimum range of variation shall be submitted. Materials exceeding the range of variation of the approved Samples will not be approved on the Work.

5.19.3.2. All costs associated with delivery of Samples will be paid by the Contractor.

5.19.4. Contractor's Verifications. Before submitting each Submittal, the Contractor shall have determined and verified:

5.19.4.1. all field measurements, quantities, dimensions specified performance criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

5.19.4.2. all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

5.19.4.3. all information relative to the Contractor's sole responsibilities in respect of means, methods, techniques, sequences, and procedures of construction and safety precautions and programs incident thereto.

5.19.5. Contractor's Representations. By approving and providing Submittals, the Contractor thereby represents that the Contractor has determined and verified all dimensions, quantities, field dimensions, relations to existing Work, coordination with Work to be installed later, coordination with information on previously accepted Submittals and verification of

compliance with all the requirements of the Contract Documents. The accuracy of all such information is the responsibility of the Contractor. In reviewing Submittals, the Design Professional shall be entitled to rely upon the Contractor's representation that such information is correct and accurate.

5.19.6. Coordination. The Contractor shall also have reviewed and coordinated each Submittal with other Submittals and with the requirements of the Work and the Contract Documents.

5.19.7. Stamp or Specific Written Indication. Each Submittal will bear a stamp or specific written indication that the Contractor has satisfied the Contractor's obligations under the Contract Documents with respect to the Contractor's review and approval of that Submittal.

5.19.8. Written Notice of Variations. At the time of each Submittal, the Contractor shall give the Design Professional specific written notice of such variations, if any, that the Submittal may have from the requirements of the Contract Documents. Such notice is to be in a written communication separate from the Submittal. Moreover, the Contractor shall make a specific notation on each Submittal to the Design Professional for review and approval of each such variation.

5.19.9. Review and Approval by the Design Professional. The Contractor shall perform no portion of the Work requiring a Submittal until the respective Submittal has been approved by the Design Professional. Such Work shall be in accordance with approved Submittals.

5.19.9.1. The Design Professional will review and approve Submittals in accordance with the schedule of Submittals accepted by the Design Professional as required above. The Design Professional's review and approval will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated in the Contract Documents. The Design Professional's review and approval will not extend to means, method, technique, sequences, or procedures of construction (except where a particular means, method, technique, sequences or procedures of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

5.19.10.Deviations. The Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Design Professional's approval of Submittals unless the Contractor has specifically informed the Design Professional in writing of such deviation at the time of Submittal and the Design Professional has given written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Submittals by the Design Professional's approval thereof.

5.19.11.Revisions. The Contractor shall make corrections required by the Design Professional and shall return the required number of corrected copies of Submittals and submit as required new Submittals for review and approval. The Contractor shall direct specific attention, in writing or on resubmitted Submittals, to revisions other than those requested by the Design Professional on previous Submittals. Unless such written notice has been given, the Design Professional's approval of a resubmitted Submittal shall not constitute approval of any changes not requested on the prior Submittal.

5.19.12.Related Work. Where a Submittal is required by the Contract Documents or the schedule of Submittals accepted by the Design Professional, any related Work performed prior to the Design Professional's review and approval of the pertinent Submittal will be at the sole expense and responsibility of the Contractor.

5.19.13.Informational Submittals. Informational Submittals upon which the Design Professional is not expected to take responsive action may be so identified in the Contract Documents.

5.19.14.Certification. When professional certification of performance criteria of materials, systems or equipment is required by the Contract Documents, the City shall be entitled to rely upon such certifications, and neither the City nor the Design Professional shall be expected to make any independent examination with respect thereto.

5.20. Continuing the Work.

5.20.1. The Contractor shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with the City. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as otherwise provided herein or as the City and the Contractor may agree in writing.

5.21. Use of Site; Access to Work.

5.21.1. The right of possession of the premises and the improvements made thereon by the Contractor shall remain at all times in the City. The Contractor's right to entry and use thereof arises solely from the permission granted by the City under the Contract Documents. The Contractor shall confine the Contractor's apparatus, the storage of materials, and the operations of the Contractor's workers to limits indicated by law, ordinance, the Contract Documents and permits and/or directions of the Design Professional and shall not unreasonably encumber the premises with the Contractor's materials. The City shall not be liable to the Contractor, the Subcontractors, Suppliers, or anyone else with respect to the conditions of the premises, except for a condition caused directly and solely by the negligence of the City.

5.21.2. At all times, the City and the Design Professional shall have access to the Work.

5.22. Protection of Persons and Property.

5.22.1. In General. The Contractor shall be responsible for initiating, maintaining, and supervising all health and safety precautions and programs in connection with the performance of the Contract. The Contractor is responsible for the implementation of all Federal, State, and local health and safety requirements. The Contractor shall be responsible for all damages to persons or property that occur as a result of the Contractor's fault or negligence in connection with the prosecution of the work and shall be responsible for the proper care and protection of all materials delivered and work performed until completion and final acceptance by CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT).

The Contractor shall provide sufficient competent watchmen, both day and night, including Saturdays, Sundays and holidays, as necessary, from the time the work is commenced until final completion and acceptance. Sufficient lighting shall be provided to aid in the prevention of injury to passersby or vandalism to the property or other illegal activities.

The Contractor shall avoid damage as a result of its operations to existing sidewalks, streets, curbs, pavements, utilities (except those which are to be replaced or removed), adjoining property, etc. and the Contractor shall at its own expense completely repair any damage thereto caused by its operations.

The Contractor shall shore up, brace, underpin, secure, and protect as may be necessary, all foundations and other parts of existing structure adjacent to, adjoining, and in the vicinity of the site, which may be in any way affected by the excavations or other operations connected with the construction of the improvements embraced in this Contract. The Contractor shall be responsible for the giving of any and all required notices to any adjoining or adjacent property owner or other party before the commencement of work. The Contractor shall indemnify and save harmless the City of Somerville and CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT) from any liability for damages on account of settlement or the loss of lateral support of adjoining property resulting from the Contractor's failure to comply with this section.

5.22.1.1. If this contract is in excess of \$100,000 and is federally funded, the Contractor shall comply with all applicable standards, orders, or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401 et seq.) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251 et seq.)

5.22.1.2. If this contract is in excess of \$2,000 and is federally funded, the Contractor shall comply with Sections 103 and 107 of the Contract Work Hours Safety Standards Acts (40 U.S.C. 327-333), as supplemented by Department of Labor regulations at 29 CFR part 5. To that end, the Contractor shall compute the wages of every mechanic and laborer on the basis of a standard workweek of 40 hours. Work in excess of the standard workweek is permissible, provided that the worker is compensated at a rate of not less than 1-1/2 times the basic rate of pay for all hours worked in excess of 40 hours in the workweek. The Contractor shall ensure that no laborer or mechanic is required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous.

5.22.2. The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to:

5.22.2.1. employees on the site and other persons who may be affected thereby;

5.22.2.2. the Work, materials, and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of the Contractor, Subcontractors, or Sub-subcontractors;

5.22.2.3. other property at the site or adjacent or in close proximity thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction; and

5.22.2.4. any other property of the City, whether or not forming part of the Work, located at the site or adjacent thereto in areas to which the Contractor has access.

5.22.3. Notices and Compliance. The Contractor shall give notices and comply in all other respects with applicable laws, ordinances, rules, regulations, codes, and lawful orders of public authorities bearing on the safety of persons or property or their protection from damage, injury, or loss. The Contractor shall notify owners of adjacent and nearby properties of underground facilities and utility owners when prosecution of the Work may affect them and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

5.22.3.1. Should the Contractor in the execution of his work uncover or discover utility service lines not indicated on the relevant drawings, or that do not show signs of singular service to any existing structures being demolished, the Contractor shall cease work in that area immediately and promptly notify the Public Works Department. Within forty-eight hours, the Public Works Department will inspect the site and issue written instructions to the Contractor. The Contractor shall proceed

with only after such written instructions have been received and shall proceed in full compliance with such instructions. The above mentioned situation or similar circumstances and/or modification if any, shall not relieve the Contractor from his responsibilities in this Contract and also it is without prejudice to any and all rights of CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT) covering this said contract and surety or bonds.

5.22.4. Erection and Maintenance of Safeguards. The Contractor shall erect and maintain, as required by existing conditions and the terms of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations, and notifying owners and users of adjacent and nearby sites and utilities.

5.22.5. Hazardous Materials and Equipment. When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under the supervision of properly qualified personnel.

5.22.6. Damage to Property. The Contractor shall promptly remedy damage and loss to property referred to above. If the damage or loss is due in whole or in part to the Contractor's failure to take the precautions required herein, the Contractor shall bear the cost, subject to any reimbursement to which the Contractor is entitled under property insurance required by the Contract Documents. The Contractor shall be fully and solely responsible for all Work and other operations carried out on adjacent properties. The insurance required under Article 8 shall cover such Work or operations, and the Contractor shall indemnify and defend the City, the Design Professional, and the owners of such adjacent or nearby properties from and against all claims, suits, losses, or costs arising out of such Work or operations.

5.22.7. Fire Protection Equipment and Services. The Contractor shall provide and maintain in good operating condition suitable and adequate fire protection equipment and services and shall comply with all reasonable recommendations regarding fire protection made by the representatives of the fire insurance company carrying insurance on the Work or by the local fire chief or fire marshal. The area within the site limits shall be kept orderly and clean and all combustible rubbish shall be promptly removed from the site.

5.22.8. Protection of Excavations, Trenches, etc. The Contractor shall at all times protect excavations, trenches, buildings and materials from rain water, ground water, backup or leakage of sewers, drains and other piping, and from water of any other origin and shall remove promptly any accumulation of water. The Contractor shall provide and operate all pumps, piping, and other equipment necessary to this end.

5.22.9. Snow and Ice Removal. The Contractor shall remove snow and ice that might result in damage or delay.

5.22.10. Safety Representative. The Contractor shall designate a qualified and experienced safety representative at the site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

5.22.11. Weather Protection. (Reference: M.G.L. c. 149, §44F(1).) The Contractor shall install weather protection and furnish adequate heat in the protected area from November 1 through March 31. In the event of temporary suspension of work, during inclement weather, the Contractor will carefully protect and will cause his subcontractors to carefully protect all work and materials against damage or injury from the weather. If, in the opinion of the Design Professional or CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT), any work or materials shall have been damaged or injured by reason of failure on the part of the Contractor or any of his Subcontractors so to protect the work, such work or materials shall be removed and replaced at the expense of the Contractor. These Specifications are not to be construed as requiring enclosures or heat for operations that are not economically feasible to protect in the judgment of CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT). Included in the preceding category, without limitation, are such items as site work, excavation, pile driving, steel erection, erection of certain "exterior" wall panels, roofing, and similar operation:

(1) "WEATHER PROTECTION" shall mean the temporary protection of that work adversely affected by moisture, wind and cold, by covering, enclosing and/or heating.

This protection shall provide adequate working areas during the months of November through March as determined by the Design Professional and consistent with the approved construction schedule to permit the continuous progress of all work necessary to maintain an orderly and efficient sequence of construction operations. The General Contractor shall furnish and install all "Weather Protection" material and be responsible for all costs, including heating required to maintain a minimum temperature of 40 degrees F, at the working surface. This provision does not supersede any specific requirements for methods of construction, curing of materials or the applicable General Conditions set forth in the Contract Articles with added regard to performance obligations of the Contractor.

(2) Within 30 calendar days after his award of contract, the General Contractor shall submit in writing to CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT) for approval, three copies of his proposed methods for "Weather Protection".

(3) Installation of weather protection and heating devices shall comply with all safety regulations including provisions for

adequate ventilation and fire protection devices. Heating devices which may cause damage to finish surfaces shall not be used.

(4) The General Contractor shall furnish and install one accurate Fahrenheit thermometer at each work area as designated by the Designer. However, one additional accurate Fahrenheit thermometer shall be provided for every 2,000 square feet of floor space where the work areas exceed 2,000 square feet.

5.22.12. Security. The Contractor shall provide, within the Contract Sum, a sufficient number of security personnel at the Site at all times when the Contractor's personnel are not present, from commencement of the Work until Substantial Completion to assure that the Site, the facility, and the Work, and all materials and equipment stored at the Site are fully and completely protected against loss or damage due to vandalism, theft, or malicious mischief. If the Contractor elects, in addition, to use guard dogs for this purpose, each dog shall at all times be accompanied by an adult handler. If the Contractor fails to comply with the requirements of this paragraph, then the City may provide appropriate security and charge the cost thereof to the Contractor. The City's provision of such security, or failure to do so, shall not relieve the Contractor of its responsibility to pay for loss or damage due to vandalism, theft, or malicious mischief at the Site.

5.22.13. Hazard Communication Programs. The Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communications information required to be made available to or exchanged between or among employers at the site in accordance with laws, codes and regulations.

5.22.14. Noise Pollution Control. The Contractor shall comply with all applicable provisions of Somerville Municipal Code §9-109.

5.23. Cutting and Patching.

5.23.1. In General. Unless otherwise provided in the Contract Documents, the Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly, including the work of the City or of separate contractors.

5.23.2. Damage to Work of City or of Separate Contractor. The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the City or separate contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the City or a separate contractor except with prior written consent of the City and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the City or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

5.23.3. Damage Caused by Contractor. Should the Contractor cause damage to the work or property of any separate contractor at the Site, or should any claim arising out of the Contractor's performance of Work at the Site be made by any separate contractor against the Contractor, the City, the Design Professional, or any of the Design Professional's consultants, the Contractor shall promptly attempt to settle with such other contractor by agreement, or to otherwise resolve the dispute by arbitration or at law. The Contractor shall, to the fullest extent permitted by laws and regulations, indemnify and hold harmless the City, the Design Professional, and the Design Professional's consultants from and against all claims, damages, losses and expenses (including, but not limited to, fees of the Design Professional, the Design Professional's consultants, attorneys, and other professionals, and court and arbitration or mediation costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any separate contractor against the City, the Design Professional, or any of the Design Professional's consultants, to the extent based on a claim arising out of the Contractor's performance of the Work. Should a separate contractor cause damage to the Work or property of the Contractor or should the performance of work by any separate contractor at the site give rise to any other claim, the Contractor shall not institute any action, legal or equitable, against the City, the Design Professional, or any of the Design Professional's consultants, or permit any action against any of them to be maintained and continued in its name or for its benefit in any court or before any arbiter which seeks to impose liability on or to recover damages from the City, the Design Professional, or any of the Design Professional's consultants, on account of any such damage or claim. If the Contractor delays at any time in performing or furnishing Work by any act or neglect of a separate contractor and the City and the Contractor are unable to agree as to the extent of any adjustment in the Contract Time attributable thereto, the Contractor may make a claim for an extension of time in accordance with Article 16. An extension of the Contract Time shall be the Contractor's exclusive remedy with respect to the City, the Design Professional, and the Design Professional's consultants, for any delay, disruption, interference, or hindrance caused by any separate contractor.

5.24. Cleaning Up.

5.24.1. During the progress of the Work, the Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract or other debris. At the completion of the Work, the Contractor shall remove from and about the Project all waste materials, rubbish, and debris, and the Contractor's tools, construction equipment, machinery, and surplus materials. Surplus materials to be provided to the City by specifications shall be stored in a clean, safe and secure area as directed by the City. The Contractor shall leave the site clean and ready for

occupancy by the City at Substantial Completion of the Work. Immediately prior to the Design Professional's inspection for Substantial Completion, the Contractor shall completely clean the premises. Concrete and ceramic surfaces shall be cleaned and washed. Resilient coverings shall be cleaned, waxed and buffed. Woodwork shall be dusted and cleaned. Sash, fixtures and equipment shall be thoroughly cleaned. Stains, spots, dust, marks and smears shall be removed from all surfaces. Hardware and all metal surfaces shall be cleaned and polished. Glass and plastic surfaces shall be thoroughly cleaned by professional window cleaners. All damaged, broken or scratched glass or plastic shall be replaced by the Contractor at the Contractor's expense. The Contractor shall restore to original condition all property not designated for alteration by the Contract Documents.

5.24.2. If the Contractor fails to clean up as provided herein, the City may do so and charge the cost thereof to the Contractor.

5.25. Royalties and Patents.

5.25.1 The Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the City and the Design Professional from and against all claims, costs, losses, and damages arising out of or resulting from any infringement of patent rights or copyrights incident to the use in the performance of the work or resulting from the incorporation in the work of any invention, design, process, product, or device not specified in the Contract Documents.

5.26. Contractor's Obligation to Perform.

5.26.1. The Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of the Contractor's obligation to perform the Work in accordance with the Contract Documents:

- 5.26.1.1.** observations by the Design Professional;
- 5.26.1.2.** recommendation of any progress or final payment by the Design Professional;
- 5.26.1.3.** the issuance of a certificate of Substantial Completion or any payment by the City to the Contractor under the Contract Documents;
- 5.26.1.4.** use or occupancy of the Work, Project, or Site, or any part thereof, by the City;
- 5.26.1.5.** any acceptance by the City or any failure to do so;
- 5.26.1.6.** any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptance by the Design Professional;
- 5.26.1.7.** any inspection, test, or approval by others; or
- 5.26.1.8.** any correction of defective Work by the City.

5.27. Indemnification; and Covenant Not To Sue.

5.27.1. To the fullest extent permitted by law, the Contractor shall assume the defense of, indemnify and hold harmless the City, the Design Professional, the Design Professional's consultants, and agents and employees of any of them, from and against claims, suits, causes of action, demands, liabilities, damages, losses, and expenses, including, but not limited, to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself) including loss of use resulting therefrom, caused in whole or in part by alleged negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this paragraph.

5.27.2. In claims against any person or entity indemnified under the foregoing paragraph by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under the foregoing paragraph shall not be limited by a limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under Workers' Compensation laws, disability benefit acts or other employee benefit acts.

5.27.3. The obligations of the Contractor in this Article shall not extend to the liability of the Design Professional, the Design Professional's consultants, and agents or employees of any of them arising out of (1) the preparation of maps, Plans, opinions, reports, surveys, Change Orders, designs, or Specifications, or (2) directions or instructions given by the Design Professional, the Design Professional's consultants and agents or employees of any of them, provided such instructions or directions are the primary cause of the injury or damage.

5.27.4. The Contractor, or any successor, assign, or subrogee of the Contractor agrees not to bring any civil suit,

action, or other proceeding in law, equity or arbitration against the **Design Professional**, or the officers, employees, agents, or consultants of the **Design Professional**, for the enforcement of any action which the **Contractor** may have arising out of or in any manner connected with the Work. The **Contractor** shall assure that this covenant not to sue is contained in all subcontracts and sub-subcontracts of every tier and shall assure its enforcement. The **Design Professional**, its officers, employees, agents, and consultants are intended third-party beneficiaries of this covenant not to sue, and are entitled to enforce this covenant in law or equity.

5.28. Survival of Obligations.

5.28.1 All representations, indemnifications, warranties, and guarantees made in, required by or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion and acceptance of the Work and termination or completion of the Contract.

**ARTICLE 6
SUBCONTRACTORS**

6.1 Use of Subcontractors.

The **Contractor** shall use the Subcontractors named in the **Contractor's** Bid. The Contractor shall not award any work to any Subcontractor without prior written approval of the CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT). The Contractor shall not award any work to any subcontractor without prior written approval of CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT), which approval will not be given until the Contractor submits a written approval statement concerning the proposed award to the subcontractor, which statement shall contain such information as CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT) may require. All subcontracts subject to Mass. General laws, Chapter 149, Sections 44A-J, shall comply with the filed sub-bid requirements of that statute. The Contractor shall be as fully responsible for the acts and omissions of his subcontractors, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him. The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the Terms of the General Conditions and other contract documents insofar as applicable to the work of subcontractors and to give the Contractor the same power as regards terminating any subcontract that CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT) may exercise over the Contractor under any provision of the contract documents. Nothing contained in this contract shall create any contractual relation between any subcontractor and CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT).

6.2 Substitution of Subcontractors.

6.2.1 The **Contractor** shall not substitute another Subcontractor therefor without notice to the **City** and the **City's** prior written consent of such substitution.

6.3 Names of Subcontractors.

6.3.1 Upon execution of the Contract with the **City**, the **Contractor** shall provide in writing to the **City**, through the **Design Professional**, the names, addresses, telephone numbers, and fax numbers of all persons proposed for each principal portion of the Work.

6.4. Objections to Subcontractors.

6.4.1 The **Contractor** shall not use any Subcontractor against whom the **City** has a reasonable objection. The **Contractor** shall not be required to contract with any person or entity against whom it has a reasonable objection.

6.5. Form of the Subcontract.

6.5.1 All Work performed by a Subcontractor shall be through an appropriate subcontract. The form of subcontract shall be submitted to the **City** for its approval, which shall not be unreasonably withheld or delayed.

6.6. Content of the Subcontract.

6.6.1. In addition to all statutorily mandated provisions and provisions required elsewhere in the Contract Documents, each subcontract shall expressly provide that:

6.6.1.1. Each subcontract agreement for a portion of the Work is assigned by the **Contractor** to the **City** provided that:

6.6.1.1.1. the assignment is effective only after termination of the Contract by the **City** or the

Contractor and only for those subcontract agreements which the **City** accepts by notifying the Subcontractor in writing; and

6.6.1.1.2. the assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

6.6.1.2. Each Subcontractor is bound by the requirements of the Contract Documents for the express benefit of the **City**.

6.6.1.3. Each Subcontractor shall assume toward the **Contractor** all the obligations that the **Contractor** assumes toward the **City** and the **Design Professional**, unless otherwise provided by law.

**ARTICLE 7
PERFORMANCE AND PAYMENT BONDS**

7.1. Form of Bonds.

7.1.1 The performance and labor and material or payment bonds shall be in the form required by the **City**, copies of which are included in the Project Manual. The **City** reserves the right to reject any bond that does not conform to the **City's** requirements.

7.2. Furnished by the Contractor. (Reference: M.G.L. c. 30, §39M(c); M.G.L. c. 149, §29).

7.2.1 The **Contractor** shall furnish a performance bond and a labor and materials or payment bond, each with a surety company qualified to do business under the laws of the Commonwealth and satisfactory to the **City** and each in the sum of the Contract Sum, the premiums for which are to be paid by the **Contractor** and are included in the Contract Sum. The bonds shall remain in effect until final payment is made. The sum of the performance bond shall increase each time the Contract Sum is increased as a result of a Change Order.

7.3. Submission to the City.

7.3.1 The **Contractor** must submit the performance and a labor and materials or payment bonds to the **City** upon the **Contractor's** execution of the Agreement.

**ARTICLE 8
INSURANCE REQUIREMENTS**

8.1 Insurance Certificates.

8.1.1 Prior to starting work on this project, the contractor shall deposit with the **City**, certificates from insurers clearly stating that the required insurance policies have been issued to the **Contractor** and will remain in effect during the time period required to complete this contract. ACCORD forms will not be accepted. The certificates must be in a form satisfactory to the **City**. The insurance shall include all major divisions of coverage, and shall be on a comprehensive general basis including: Premises and Operations (including X-C-U), Owners and Contractors Protective, Products and Completed Operations, Owned, Non-owned or Hired and/or Leased Motor Vehicles. Such insurance shall be written for not less than any limits of liability, required by law or the following limits, whichever are greater.

8.2 Minimum Coverages. The **Contractor** shall possess and maintain throughout the contract period/project, insurance in the kinds and amounts as stated in the Specification included in Appendix C of this Agreement. The **Contractor** may purchase and maintain excess liability insurance in the in the umbrella form in order to satisfy the limits of liability required for the insurance to be purchased and maintained in accordance with the required requirements set forth above (in addition to the umbrella limits required). Evidence of such excess liability shall be delivered to the **City** in the form of a certificate and the certificate indicating the policy numbers and limits of liability of all underlying insurance.

8.3 Additional Insured. The **City** shall be named as an additional insured on each certificate, and the certificate must have the endorsement of the insurance agency.

8.4 Notice. Each certificate shall contain a notation that the insurer will give 30 days notice to the **City** prior to cancellation, change or non-renewal of policy.

8.5 Carrier Rating. Insurance carriers MUST have an A.M. Best rating of "A" or better.

8.6 Material Breach. Failure of the contractor to provide and continue in force such insurance shall be deemed a material breach of contract and shall operate as immediate termination thereof.

**ARTICLE 9
TESTS AND INSPECTIONS**

9.1. Access.

9.1.1 The City, the **Design Professional**, and all other persons designated by the City shall have access to the Work at reasonable times for observing, inspecting, and testing. The **Contractor** shall provide them with proper and safe conditions for such access and advise them of the **Contractor's** site safety procedures and programs so that they may comply therewith as applicable.

9.2. Tests and Inspections.

9.2.1. The **Contractor** shall give the **Design Professional** timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

9.2.2. Unless otherwise provided, the **Contractor** shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the City, or with the appropriate public authority and shall bear all related costs of tests, inspections, and approvals. If the laws or regulations of any public body having jurisdiction require any Work or part thereof specifically to be inspected, tested, or approved by an employee or other representative of such public body, the **Contractor** shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith and furnish the **Design Professional** with the required certificates of inspection, testing, or approval.

9.2.3. The **Contractor** shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for the **Design Professional's** acceptance of materials or equipment to be incorporated into the Work, or of materials, mix designs, or equipment submitted for approval prior to the **Contractor's** purchase thereof for incorporation into the Work.

9.2.4. If any Work that is to be inspected, tested, or approved is covered by the **Contractor**, Subcontractor, or Sub-subcontractor without the prior written consent of the **Design Professional**, it must be uncovered for observation, inspection, testing, or approval, if requested by the **Design Professional**. The **Contractor** must recover the Work at its own expense.

9.2.5. The **Contractor** shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the **Design Professional** in the **Design Professional's** administration of the Contract or by tests, inspections, or approvals required or performed by persons other than the **Contractor**.

**ARTICLE 10
UNCOVERING AND CORRECTING WORK**

10.1. Uncovering Work.

10.1.1. If a portion of the Work is covered contrary to the **Design Professional's** request or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the **Design Professional**, be uncovered for the **Design Professional's** observation and be replaced, both at the **Contractor's** expense and without change in the Contract Time.

10.1.2. If a portion of the Work has been covered which the **Design Professional** has not specifically requested to observe prior to its being covered, the **Design Professional** may request to see such Work, and it shall be uncovered by the **Contractor**. If it is found that such Work is in accordance with the Contract Documents, costs of uncovering and replacing shall, by appropriate Change Order, be charged to the City. If it is found that such Work is defective or not in accordance with the Contract Documents, the **Contractor** shall pay all claims, costs, losses, and damages caused by, arising out of or resulting from such uncovering, exposure, observation, inspection, and testing and of satisfactory replacement of reconstruction (including, but not limited to, all costs of repair or replacement of work of others); and the City shall be entitled to an appropriate decrease in the Contract Sum. The City may take such decrease by reducing the then current application for payment accordingly or subsequent applications, if necessary, until the decrease is paid in full.

10.2. Correcting Work.

10.2.1. The **Contractor** shall promptly correct Work rejected by the **Design Professional** or failing to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed, or completed. The **Contractor** shall bear all costs of correcting such rejected Work including additional testing and inspections and compensation for the **Design Professional's** services and expenses made necessary thereby and any cost, loss, or damages to the City resulting from such failure or defect.

10.2.2. If, within one (1) year after the date of Substantial Completion of the Work or designated portion thereof, or after the date for commencement of warranties established in Article 15, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the City to do so, unless the City has previously given the Contractor a written acceptance of such condition. This period of one (1) year shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work. This obligation to correct under this paragraph shall survive acceptance of the Work under the Contract and termination of the Contract. The City shall give such notice promptly after discovery of the condition.

10.2.3. The **Contractor** shall correct, remove, or replace portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the **Contractor** nor accepted by the City.

10.2.4. If the **Contractor** fails within a reasonable time to correct nonconforming Work, or to remove and replace rejected Work, or fails to perform the Work in accordance with the Contract Documents, the **City** may correct it in accordance with the provisions herein. If the **Contractor** does not proceed with correction, removal, or replacement of such nonconforming Work within seven (7) days from the date of written notice from the **Design Professional**, the **City** may correct it and store any salvageable materials or equipment at the **Contractor's** expense. If the **Contractor** does not pay costs of any such removal and storage within ten (10) days after written notice, the **City** may upon ten (10) additional days' written notice sell such materials and equipment at auction or at private sale and shall account for the proceeds thereof, after deducting costs and damages that should have been borne by the **Contractor**, including compensation for the **Design Professional's** services and expenses made necessary thereby. If such proceeds of sale do not cover all the costs that the **Contractor** should have born, the Contract Sum shall be reduced by the deficiency. If payments then or thereafter due the **Contractor** are not sufficient to cover such amount, the **Contractor** shall pay the difference to the **City**.

10.2.5. The **Contractor** shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the **City** or separate contractors caused by the **Contractor's** correction or removal of Work which is not in accordance with the requirements of the Contract Documents.

10.2.6. Nothing contained in this paragraph shall be construed to establish a period of limitation with respect to other obligations that the **Contractor** might have under the Contract Documents. Establishment of the time period of one (1) year as described in the above paragraph related only to the specific obligation of the **Contractor** to correct the Work and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced nor to the time within which proceedings may be commenced to establish the **Contractor's** liability with respect to the **Contractor's** obligations other than specifically to correct the Work.

10.3. Acceptance of Nonconforming Work.

10.3.1 If, instead of requiring correction or removal and replacement of defective or nonconforming Work, the **City** prefers to accept Work which is not in accordance with the requirements of the Contract Documents, the **City** may do so instead of requiring its removal and correction, in which case the **Contractor** shall pay all claims, costs, losses, and damages attributable to the **City's** evaluation of and determination to accept such defective or non-conforming Work. The Contract Sum will be reduced as appropriate. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 11 CHANGES IN THE WORK

11.1. In General.

11.1.1. The Contract Sum constitutes the total compensation (subject to authorized adjustments) payable to the **Contractor** for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by the **Contractor** shall be at the **Contractor's** expense without any change in the Contract Sum.

11.1.2. Without invalidating the Contract and without notice to any surety, the **City** may, at any time or from time to time, order additions to, deletions from, or revisions in the Work. Such additions, deletions, or revisions will be authorized by a Change Order, a Modification or a **Construction Change Directive**. Upon receipt of any such document, the **Contractor** shall promptly proceed with the Work involved that will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

11.1.3. The **Contractor** shall not be entitled to an increase in the Contract Sum or an extension of the Contract Time with respect to any Work performed that is not required by the Contract Documents as amended, modified, or supplemented, except as otherwise provided herein.

11.2. Change Orders.

11.2.1. (*Reference: M.G.L. c. 30, §391*). The **Contractor** shall perform all the Work required by this Contract in conformity with the Plans and Specifications contained herein. No willful and substantial deviation from said Plans and Specifications shall be made unless authorized in writing by the **City** and the **Design Professional** in charge of the Work who is duly authorized by the **City** to approve such deviations. In order to avoid delays in the prosecution of the Work required by such Contract, such deviation from the Plans or Specifications may be authorized by a written order of the **City** or the **Design Professional** so authorized to approve such deviation. Within thirty (30) days thereafter, such written order shall be confirmed by a certificate of the **City**, using AIA Document G701 (or its equivalent), stating: (1) If such deviation involves any substitution or elimination of materials, fixtures or equipment, the reasons why such materials, fixtures, or equipment were included in the first instance and the reasons for substitution or elimination, and, if the deviation is of any other nature, the reasons for such deviation, giving justification therefor; (2) that the specified deviation does not materially injure the Project as a whole; (3) that either the work substituted for the Work specified is of the same cost and quality, or that an equitable adjustment has been agreed upon between the **City** and the **Contractor** and the amount in dollars of said adjustment; and (4) that the

deviation is in the best interest of the **City**. The Change Order shall also indicate whether or not the date of substantial completion has been extended. The equitable adjustment in price shall be determined by the unit prices, if any, in the General Contractor's bid; otherwise, it shall be a number which is agreed to by both parties as a fair adjustment and which can be itemized and substantiated to the reasonable satisfaction of the Contracting Authority. Where increases and decreases to the Contract Sum are included in one Change Order, the negotiated allowance for overhead and profit shall be calculated on the basis of the net increase, if any.

11.3. Construction Change Directive.

11.3.1. A **Construction Change Directive** shall be used in the absence of total agreement on the terms of a Change Order.

11.3.2. Upon request of the **City** or the **Design Professional**, the **Contractor** shall without cost to the **City** submit to the **Design Professional** in such form as the **Design Professional** may require, an accurate written estimate of the cost of any proposed extra work or change. The estimate shall indicate the quantity and unit cost of each item of materials, and the number of hours of work and hourly rate for each class of labor, as well as the description and amounts of all other costs chargeable under the terms of this Article. Unit labor costs for the installation of each item of materials shall be shown if required by the **Design Professional**. If required by the **Design Professional**, in order to establish the exact cost of new Work added or of previously required Work omitted, the **Contractor** shall obtain and furnish to the **Design Professional** bona fide proposals from recognized Suppliers for furnishing any material included in such Work. Such estimates shall be furnished promptly so as to occasion no delay in the Work, and shall be furnished at the **Contractor's** expense.

11.3.3. The **Contractor** shall state in the estimate any extension of time required for the completion of the Work if the change or extra Work is ordered. The **Contractor** shall document, through a critical path analysis, or some other clearly delineated explanation, how the proposed change affects other aspects of the Work, and why it would require an extension of time. The **Contractor** shall promptly revise and resubmit such estimate if the **Design Professional** determines that it is not in compliance with the requirements of this Article, or that it contains errors of fact or mathematical errors.

11.3.4. If the **Construction Change Directive** provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods, as selected by the **City**, selection of which does not require the consent of the **Contractor**:

11.3.4.1. by unit prices stated in the Contract Documents or otherwise mutually agreed upon; or

11.3.4.2. by Cost and Percentages estimated by the **Contractor** as provided herein and accepted by the **City**, whereupon the **Contractor's** estimate shall become a fixed price which shall not be changed by any variation in the actual cost of executing the Work covered by the change; or

11.3.4.3. by actual Cost determined after the Work covered by the change is completed, plus Percentage; or

11.3.4.4. by submission to arbitration or a court, which shall determine the fair value of the Work covered by the change.

11.3.5. "Cost" shall mean the estimated or actual net increase or decrease in cost to the **Contractor**, Subcontractor, or Sub-subcontractor for performing the Work covered by the change, including actual payments for materials, equipment rentals, expendable items, wages, and associated benefits to the workers and to supervisors employed full time at the Site, insurance, bonds, and other provable direct costs, but not including any administrative, accounting or expediting costs, or other indirect or overhead costs, or any wages or benefits of supervisory personnel not assigned full time to the Site, or any amount for profit or fee to the **Contractor**, Subcontractor, or Sub-subcontractor.

11.3.6. "Percentage" shall mean an allowance to be added to or subtracted from the Cost in lieu of overhead and profit and of any other expense that is not included in the Cost of the Work covered by the change, as defined above. Percentage for a Sub-subcontractor shall be 8% of any net increase or decrease of Cost of any Work performed by the Sub-subcontractor's own forces plus 4% of any net increase or decrease in Cost of any Work performed for the Sub-subcontractor by lower tier Sub-subcontractors. Percentage for a Subcontractor shall be 12% of any net increase or decrease of Cost of any Work performed by the Subcontractor's own forces plus 4% of the Cost of any Work performed by Sub-subcontractors. Percentage for the **Contractor** shall be 15% of any net increase or decrease of Cost of any Work performed by the **Contractor's** own forces plus 5% of any net increase or decrease in the Cost for all other Work covered by the change. When the **Contractor** is also performing Work as a Subcontractor or Sub-subcontractor, the **Contractor** shall only be entitled to a total of no more than 15% of any net increase or decrease of Cost of any Work.

11.3.7. When in the reasonable judgment of the **Design Professional** a series of **Construction Change Directives** or Change Orders effect a single change, Percentage shall be calculated on the cumulative net increase or decrease in Cost, if any.

11.3.8. If unit prices are stated in the Contract Documents or are subsequently agreed upon, and if quantities originally contemplated are so changed in a Proposed Change Order or **Construction Change Directive** that the application of such unit prices to quantities of Work proposed will cause substantial inequity to the **City** or the **Contractor**, the applicable unit prices shall be equitably adjusted. Wherever the estimated quantities of work to be done and materials to be furnished under this

contract are shown in any of the documents including the proposal, they are given for use in comparing bids and the right is especially reserved herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT) to complete the work contemplated by the contract, nor shall any such increases or diminution shall in no way violate this contract, nor shall any such increase or diminution give cause for claims or liability for damages.

11.3.9. If the City elects to determine the Cost of the Work as provided in method (11.3.4.1) using unit prices stated in the Contract Documents or subsequently agreed upon, the unit prices shall be subject to the prior paragraph. Notwithstanding the inclusion of unit prices in the Contract Documents, it shall be the City's option to require the Cost of any given change to be determined by one of the other methods stated in 11.3.4. If the City elected to determine the Cost of the change by unit prices and the nature of the work is such that its extent cannot readily be measured after the completion of such work or any subsequent Work, the Contractor shall keep daily records, available at all times to the Design Professional for inspection, of the actual quantities of such Work put in place, and delivery receipts or other adequate evidence, acceptable to the Design Professional, indicating the quantities of materials delivered to the Site for use in such unit price Work, and distinguishing such from other similar material delivered for use in Work include in the base Contract Sum. If so required by the Design Professional, materials for use in unit price Work shall be stored apart from all other materials on the Project.

11.3.10. If the City elects to determine the Cost of the Work as provided in methods 11.3.4.3. or 11.3.4.4. or if the method of determining the Cost has not been established before the Work is begun, the Contractor shall keep detailed daily records of labor and material costs applicable to the Work.

11.3.11. Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Design Professional in writing of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Time.

11.3.12. A Construction Change Directive signed by the Contractor indicates the agreement of the Contractor therewith, including adjustment in the Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

11.3.13. If the Design Professional and the Contractor do not agree with the adjustment in the Contract Time or the method for determining it, the adjustment or the method shall be referred to the Design Professional for determination.

11.4. Minor Changes in the Work.

11.4.1. The Design Professional has the authority to order minor changes in the Work. "Minor changes" as used in this paragraph mean changes which are so insignificant as to not affect the Contract Sum or the Contract Time and which are not inconsistent with the intent of the Contract Documents. Any minor change shall be committed to a written order which shall be binding on both the City and the Contractor and which shall be promptly carried out by the Contractor.

11.5. Certificate of Appropriations. (Reference: M.G.L. c. 44, §31C.) This Contract shall not be deemed to have been made until the City's auditor has certified thereon that an appropriation in the amount of this Contract is available therefor and that an officer or agent of the City has been authorized to execute said Contract and approve all requisitions and change orders. No order to the Contractor for a change in or addition to the Work, whether in the form of a drawing, plan, detail or any other written instruction, unless it is an order which the Contractor is willing to perform without any increase to the Contract price, shall be deemed to be given until the auditor has certified thereon that an appropriation in the amount of such order is available therefore; but such certificate shall not be construed as an admission by the City of its liability to pay for such work. The certificate of the auditor that an appropriation in the amount of this Contract or in the amount of such order is available shall bar any defense by the City on the grounds of insufficient appropriation.

ARTICLE 12 CHANGE IN THE CONTRACT TIME

12.1. Date of Commencement.

12.1.1. The date of commencement of the Work is the date established in the Notice to Proceed. The date shall not be postponed by the failure to act of the Contractor or persons or entities for whom the Contractor is responsible.

12.2. Progress and Completion.

12.2.1. Time is of the essence; all time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

12.2.2. The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

12.2.3. At least ten (10) working days after the Notice to Proceed or twenty (20) working days before the first application for payment, the Contractor shall submit to the Design Professional a progress schedule showing for each class of

Work included in the schedule of values, the percentage of completion to be obtained and the total dollar value of Work to be completed as of the first of each month until Substantial Completion. All calculations shall be on the basis of Work in place, but may include, at the Design Professional's discretion, the value of materials delivered but not in place.

12.2.4. The progress schedule shall be based on an orderly progression of the Work, allowing adequate time for each operation (including adequate time for submission and review of submittals), and leading to a reasonable certainty of Substantial Completion by the date established in the Agreement. The progress schedule will be reviewed by the Design Professional for compliance with the requirements of this Article and will be accepted by the Design Professional or returned to the Contractor for revision and resubmittal. Unless specifically required by law, no payment under this Contract shall be due until the progress schedule has been approved by the Design Professional. The Design Professional's review of the progress schedule shall not impose any duty on the Design Professional or the City with respect to the timing, planning, scheduling, or execution of the Work. In particular, if the Contractor proposes a progress schedule indicating a date of Substantial Completion which is earlier than the Contract Time, the Contractor shall not be entitled to additional payment or compensation of any kind if, for any reason, the full Contract Time is required to achieve Substantial Completion of the Work.

12.2.5. If in any Application for Payment, the total value of the completed Work in place, as certified by the Design Professional, is less than 90% of the total value of the Work in place estimated in the progress schedule, the City may, at the City's option, require the Contractor to accelerate the progress of the Work without cost to the City by increasing the workforce or hours or Work or by other reasonable means approved by the Design Professional.

12.2.6. If each of three successive applications, as certified by the Design Professional, indicate that the actual Work completed is less than 90% of the values estimated in the progress schedule to be completed by the respective dates, the City may at the City's option, treat the Contractor's delinquency as a default justifying the action permitted under Article 18.

12.2.7. If the Design Professional has determined that the Contractor should be permitted to extend the time for completion as provided below, the calendar dates in the progress schedule shall be adjusted accordingly to retain their same relationship to the adjusted date of Substantial Completion, and the dollar value of the Work to be completed as of the first of each month shall be adjusted pro rata.

12.2.8. If the Contractor fails to submit any application for payment in any month, the Design Professional shall, for the purpose of this evaluation of progress, certify separately to the actual value of the Work in place completed as of the first of the month to the best of the Design Professional's knowledge.

12.2.9. Nothing herein shall limit the City's right to liquidated or other damages for delays by the Contractor or to any other remedy which the City may be entitled to or may possess under other provisions of the Contract Documents or by law.

12.3. Delays and Extensions of Time.

12.3.1. If the Contractor is delayed at any time in the progress of the Work by an act or neglect of the City or the Design Professional, or of an employee of either, or of a separate contractor employed by the City, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, or other causes (except weather) beyond the Contractor's control, or by delay authorized by the City, or by other causes which the Design Professional determines may justify delay, then the Contract Time shall be extended by Change Order or Construction Change Directive for such reasonable time as the Design Professional may determine.

12.3.2. Claims relating to time shall be made in accordance with applicable provisions of Article 16.

12.3.3. No claim for extension of time shall be allowed on account of failure of the Design Professional to furnish Plans, Specifications or instructions or to return Shop Drawings or Samples until fifteen (15) days after receipt by the Design Professional by registered or certified mail of written demand for such instructions, Plans, Specifications, or Samples, and then not unless such claim is reasonable.

12.3.4. No extensions of time shall be granted because of seasonal or abnormal variations in temperature, humidity or precipitation, which conditions shall be wholly at the risk of the Contractor, whether occurring within the time originally scheduled for completion or within the period of any extension granted. There shall be no increase in the Contract Sum on account of any additional costs of operations or conditions resulting therefrom.

12.3.5. The Contractor hereby agrees that the Contractor shall have no claim for damages of any kind against the City or the Design Professional on account of any delay in the commencement of the Work and/or any hindrance, delay, or suspension of any portion of the Work, whether such delay is caused by the City, the Design Professional, or otherwise, except as and to the extent expressly provided under M.G.L. c. 30, §390, in the case of written orders by the City. The Contractor acknowledges that the Contractor's sole remedy for any such delay and/or suspension will be an extension of time as provided in this Article.

12.3.6. (Reference: M.G.L. c. 30, §390.) (a) The City may order the Contractor in writing to suspend, delay, or interrupt all or any part of the Work for such period of time as it may determine to be appropriate for the convenience of the City, provided however that if there is a suspension, delay, or interruption for fifteen (15) days or more due to a failure of the City to act within the time specified in this Contract, the City shall make an adjustment in the

Contract prices for any increase in the cost of performance of this Contract under this provision for any suspension, delay, interruption, or failure to act to the extent that such is due to any cause for which this Contract provides for an equitable adjustment of the Contract price under any other Contract provisions.

(b) The **Contractor** must submit the amount of a claim under provision (a) to the **City** in writing as soon as practicable after the end of the suspension, delay, interruption, or failure to act and, in any event, not later than the date of final payment under this Contract and, except for costs due to a suspension order, the **City** shall not approve any costs in the claim incurred more than twenty (20) days before the **Contractor** notified the **City** in writing of the act or a failure to act involved in the Claim.

In the event a suspension, delay, interruption, or failure to act of the **City** increases the cost of performance to any Subcontractor, that Subcontractor shall have the same rights against the **Contractor** for payment for an increase in the cost of its performance as provisions (a) and (b) give the **Contractor** against the **City**, but nothing in provisions (a) and (b) shall in any way change, modify, or alter any other rights which the **Contractor** or the Subcontractor may have against each other.

12.4. Liquidated Damages.

12.4.1. If the **Contractor** shall fail to achieve Substantial Completion within the Contract Time, it shall be liable to pay the **City** the daily amount specified in the Agreement, not as a penalty, but as a fixed and agreed upon damages for breach of contract. The said amount is fixed and agreed upon because of the difficulty of ascertaining the **City's** actual damages. It is mutually understood that the said amount is a reasonable approximation or estimate thereof as of the date of the Agreement. The **City** may elect to withhold said amount from periodic or final payments due to the **Contractor**, in addition to retainage and other back charges.

12.5. Changes in the Contract Time.

12.5.1. **In Writing.** The Contract Time may only be changed by a Change Order or a Modification. Any claim for an adjustment of the Contract Time shall be based on a written notice delivered to the party making the claim to the other party and to the **Design Professional** promptly (but in no event later than seven (7) days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within thirty (30) days after such occurrence and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Time shall be determined by the **Design Professional** in accordance with Article 16. No claim for an adjustment in the Contract Time will be valid if not submitted in accordance with the requirements of this paragraph.

12.5.2. **Early Completion.** The Contract Time shall not be changed due to a delay in the **Contractor's** early completion date.

ARTICLE 13 PAYMENTS

13.1. Schedule of Values.

13.1.1. The **Contractor** shall submit to the **Design Professional** a schedule of values which shall subdivide the Work into its component parts and shall include quantities, direct craft labor worker hours, labor cost and material/equipment cost. Labor cost shall include an appropriate amount of construction equipment costs, supplemental costs, administrative expenses, contingencies, and profit. The **Contractor** shall prepare the schedule of values in such form and supported by such data to substantiate its accuracy as the **Design Professional** may require and shall be revised if later found by the **Design Professional** to be inaccurate. This schedule, unless objected to by the **Design Professional**, shall be used as a basis for reviewing the **Contractor's** applications for payment.

13.2. Content and Submission of Applications for Payment.

13.2.1. At least ten (10) days before the date established for each progress payment, the **Contractor** shall submit to the **Design Professional** six (6) copies of an itemized application for payment for Work completed in accordance with the schedule of values. Such application shall be in a form or format established or approved by the **Design Professional** and shall be supported by documentation substantiating the **Contractor's** right to payment.

13.2.2. When **Construction Change** Directives have set forth an adjustment to the Contract Sum but have not yet been included in Change Orders, the value established by the **City** may be included in the application.

13.2.3. Applications covering Work of Subcontractors or Suppliers shall not include requests for payments of amounts the **Contractor** does not intend to pay to a Subcontractor or Supplier because of a dispute or other reason. The **Contractor** shall not be paid for any Work performed by a Subcontractor unless and until the **City** receives for that Subcontractor a certificate of insurance that conforms to the requirements of the Contract Documents.

13.2.4. Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and

equipment delivered and suitably stored at the Site for subsequent incorporation in the Work. If approved in advance by the **City**, payment may similarly be made for materials and equipment suitably stored off the Site at a location agreed upon in writing. Payment for materials and equipment stored on or off the Site shall be conditioned upon the application for payment being accompanied by a bill of sale, an invoice, or other documentation warranting that the **City** has received the materials and equipment free and clear of all liens, claims, security interests, or encumbrances, hereinafter collectively referred to as "liens," and evidence that the materials and equipment are covered by appropriate insurance and other arrangements to protect the **City's** interest therein.

13.2.5. Each application for payment or periodic estimate requesting payment shall be accompanied by, at the **City's** option, a certificate from each Subcontractor stating that the Subcontractor has been paid all amounts due the Subcontractor on the basis of the previous periodic payment to the **Contractor**, or else stating the amount not so paid and the reason for the discrepancy. In the event of any such discrepancy, the **Contractor** shall furnish the **Contractor's** own written explanation to the **City** through the **Design Professional**. Such waiver or certificate shall be in a form acceptable to the **City**.

13.3. False Applications for Payment.

13.3.1. (*Reference: M.G.L. c. 266, §§67B*). Any person who makes or presents to any claim upon or against any employee or department of the **City**, knowing such claim to be false, fictitious, or fraudulent shall be punished by a fine or not more than ten thousand dollars (\$10,000) or by imprisonment in the state prison for not more than five (5) years, or in the house of correction for not more than two and one-half years, or both.

13.4. Review of Applications for Payment.

13.4.1. The **Design Professional** shall review each application for payment and will reject any application that (1) is not accompanied by the required documentation or (2) contains errors, mathematical or otherwise.

13.4.2. Within five (5) business days after receipt of an application for payment, the **Design Professional** will either (1) return the application to the **Contractor** with a written explanation as to why it was rejected or (2) issue to the **City** a certificate for payment, with a copy to the **Contractor**, for such amount as the **Design Professional** determines is properly due. In the event an application is returned to the **Contractor**, the date of receipt of the application shall be the date of receipt of the corrected application.

13.4.3. The **Design Professional** or the **City** may make changes to any application submitted by the **Contractor**.

13.4.4. By recommending any payment, the **Design Professional** will not thereby be deemed to have represented that: (1) exhaustive or continuous on-site inspections have been made to check the quality or the quantity of the Work beyond the responsibilities specifically assigned to the **Design Professional** in the Contract Documents or (2) that there may not be other matters or issues between the parties that might entitle the **Contractor** to be paid additionally by the **City** or entitle the **City** to withhold payment to the **Contractor**. The **Design Professional's** approval of the application for payment and the accompanying documentation shall indicate that to the best of the **Design Professional's** knowledge, information, and belief, the Work has progressed to the point indicated by the **Contractor**, and that the quality of the Work is in accordance with the Contract Documents, subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests specified in the Contract Documents, final determination of quantities and classifications for unit price work and any other qualifications so stated.

13.4.5. The **Design Professional's** recommendation of any payment shall not mean that the **Design Professional** is responsible for the **Contractor's** means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of the **Contractor** to comply with laws and regulations applicable to the furnishing or performance of Work, or for any failure of the **Contractor** to perform or furnish Work in accordance with the Contract Documents.

13.4.6. No certificate given or payment made shall be evidence of the performance of this Contract, either wholly or in part and no payment, whether made upon the final certificate or otherwise, shall be construed as an acceptance of defective work or materials.

13.5. Decisions to Withhold Certification.

13.5.1. The **Design Professional** may refuse to recommend the whole or any part of any payment if, in the **Design Professional's** opinion, it would be incorrect to make the representations to the **City** referred to above.

13.5.2. If the **Contractor** and the **Design Professional** cannot agree on a revised amount, the **Design Professional** will promptly approve a certificate for payment for the amount for which the **Design Professional** is able to make such representations to the **City**. The **Design Professional** may also decide not to certify payment or, because of subsequently discovered evidence or subsequent observations, may nullify the whole or a part of a certificate for payment previously issued, to such extent as may be necessary in the **Design Professional's** opinion to protect the **City** from loss because of:

13.5.2.1. defective Work not remedied;

- 13.5.2.2. third party claims filed or reasonable evidence indicating probable filing of such claims;
- 13.5.2.3. failure of the **Contractor** to make payments properly to Subcontractors or for labor, materials or equipment;
- 13.5.2.4. reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- 13.5.2.5. damage to the **City** or another contractor;
- 13.5.2.6. reasonable evidence that the Work will not be completed within the Contract Time, and that retainage currently held by the **City** would not be adequate to cover actual or liquidated damage for the anticipated delay;
- 13.5.2.7. persistent failure to carry out the Work in accordance with the Contract Documents; or
- 13.5.2.8. failure of mechanical trade or electrical trade subcontractors to comply with mandatory requirements for maintaining record drawings. The **Contractor** shall check record drawings each month. Written confirmation that the record drawings are current will be required by the **Design Professional** before approval of the **Contractor's** monthly payment requisition.

13.5.3. When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

13.6. Progress Payments.

13.6.1. After the **Design Professional** has issued a certificate for payment, the **City** shall make payment in the manner and within the time provided in the Contract Documents.

13.6.2. (*Reference:* M.G.L. c. 30, §39G, 39K;). In the case of Contracts for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building when the amount is more than two thousand dollars, the following paragraph applies: Within fifteen days (30 days in the case of the commonwealth, including local housing authorities) after receipt from the contractor, at the place designated by the awarding authority if such a place is so designated, of a periodic estimate requesting payment of the amount due for the preceding month, the awarding authority will make a periodic payment to the contractor for the work performed during the preceding month and for the materials not incorporated in the work but delivered and suitably stored at the site (or at some location agreed upon in writing) to which the contractor has title or to which a subcontractor has title and has authorized the contractor to transfer title to the awarding authority, upon certification by the contractor that he is the lawful owner and that the materials are free from all encumbrances, but less (1) a retention based on its estimate of the fair value of its claims against the contractor and less (2) a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, and less (3) a retention not exceeding five per cent of the approved amount of the periodic payment. After the receipt of a periodic estimate requesting final payment and within sixty-five days after (a) the contractor fully completes the work or substantially completes the work so that the value of the work remaining to be done is, in the estimate of the awarding authority, less than one per cent of the original contract price, or (b) the contractor substantially completes the work and the awarding authority takes possession for occupancy, whichever occurs first, the awarding authority shall pay the contractor the entire balance due on the contract less (1) a retention based on its estimate of the fair value of its claims against the contractor and of the cost of completing the incomplete and unsatisfactory items of work and less (2) a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, or based on the record of payments by the contractor to the subcontractors under this contract if such record of payment indicates that the contractor has not paid subcontractors as provided in section thirty-nine F. If the awarding authority fails to make payment as herein provided, there shall be added to each such payment daily interest at the rate of three percentage points above the rediscount rate than charged by the Federal Reserve Bank of Boston commencing on the first day after said payment is due and continuing until the payment is delivered or mailed to the contractor; provided, that no interest shall be due, in any event, on the amount due on a periodic estimate for final payment until fifteen days (twenty-four days in the case of the commonwealth) after receipt of such a periodic estimate from the contractor, at the place designated by the awarding authority if such a place is so designated. The contractor agrees to pay to each subcontractor a portion of any such interest paid in accordance with the amount due each subcontractor.

For all other construction contracts, progress payments are governed by chapter 30, §39G, and as follows: The **City** shall pay the amount due pursuant to any periodic, Substantial Completion or final estimate within thirty-five (35) days after receipt of written acceptance for such estimate from the **Contractor**. In the case of periodic payments, the **City** may deduct from its payment a retention based on its estimate of the fair value of its claims against the **Contractor**, a retention for direct payments to Subcontractors based on demands for same in accordance with M.G.L. c. 30, §39F; and a retention to secure satisfactory performance of the contractual work, not exceeding five percent (5%) of the approved amount of any periodic payment, and the same right to retention shall apply to bonded Subcontractors entitled to direct payment under M.G.L. c. 30, §39F; provided, that a five percent (5%) value of all items that are planted in the ground shall be deducted from the periodic payments until final acceptance.

Retainage prior to Substantial Completion. In all construction contracts, the **City** may hold back a retainage of up to five percent of each progress payment to ensure satisfactory completion of the work. In addition, the **City** may withhold any amounts in dispute, including disputed change orders and direct payments owed to subcontractors pursuant to Chapter 30, §39F of the General Laws.

Payment upon Substantial Completion. In the case of contracts for construction, reconstruction, alteration, repair, remodeling, or demolition of a public building, where the amount is more than \$2,000, Chapter 30, Section 39K, of the General Laws governs payment upon substantial completion. For all other contracts, Chapter 30, Section 39F of the General Laws governs payment upon substantial completion.

13.6.3. No periodic, Substantial Completion or final estimate or acceptance or payment thereof shall bar the **Contractor** from reserving all rights to dispute the quantity and amount of, or the failure of the **City** to approve a quantity and amount of, all or part of any Work item or extra Work item.

13.7. Final Payment.

13.7.1. After final inspection and after the **Contractor** has completed all the required corrections to the satisfaction of the **Design Professional** and the **City** and delivered in accordance with the Contract Documents all maintenance and operating instructions, schedules, guarantees, bonds, certificates, or other evidence of insurance, certificates of inspection, marked-up record documents, and all other documents called for in the Contract Documents, as well as any surplus materials requested by the **City**, the **Contractor** may make an application for final payment as provided below.

13.7.2. (*Reference:* M.G.L. c. 30, §39G;). Within thirty (30) days after receipt by the **City** of a notice from the **Contractor** stating that all of the Work required by the Contract has been completed, the **City** shall prepare and forthwith send to the **Contractor** for acceptance a final estimate for the quantity and price of the Work done and all retainage on the Work less all payments made to date, unless the **City's** inspection shows that Work required by the Contract remains incomplete or unsatisfactory, or that documentation required by the Contract has not been completed.

13.7.3. The making and acceptance of final payment will constitute a waiver of all claims by the **Contractor** against the **City** other than those previously made in writing and still unsettled.

13.7.4. Interest. If the **City** fails to pay the **Contractor** within the time periods mandated by statute, the **City** shall pay interest to the **Contractor** in accordance with Chapter 30, Sections 39G and 39K, whichever is applicable.

13.8. Payments to Subcontractors.

13.8.1. Neither the **City** nor the **Design Professional** shall have an obligation to pay or see to the payment of money to a Subcontractor, Sub-subcontractor, or Supplier except as may otherwise be required by law.

13.8.2. (*Reference:* M.G.L. c. 30, §39F;). (1) Every contract awarded pursuant to sections forty-four A to L, inclusive, of chapter one hundred and forty-nine shall contain the following subparagraphs (a) through (i) and every contract awarded pursuant to section thirty-nine M of chapter thirty shall contain the following subparagraphs (a) through (h) and in each case those subparagraphs shall be binding between the general contractor and each subcontractor.

(a) Forthwith after the **Contractor** receives payment on account of a periodic estimate, the **Contractor** shall pay to each Subcontractor the amount paid for the labor performed and the materials furnished by that Subcontractor, less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the Subcontractor by the **Contractor**.

(b) Not later than the sixty-fifth day after each Subcontractor substantially completes its Work in accordance with the Plans and Specifications, the entire balance due under the subcontract, less amounts retained by the **City** as the estimated cost of completing the incomplete and unsatisfactory items of Work, shall be due the Subcontractor; and the **City** shall pay that amount to the **Contractor**. The **Contractor** shall forthwith pay to the Subcontractor the full amount received from the **City** less any amount specified in any court proceeding barring such payment and also less any amount claimed due from the Subcontractor by the **Contractor**.

(c) Each payment made by the **City** to the **Contractor** pursuant to paragraphs (a) and (b) of M.G.L. c. 30, §39F(1); for the labor performed and the materials furnished by a Subcontractor shall be made to the **Contractor** for the account of that Subcontractor; and the **City** shall take reasonable steps to compel the **Contractor** to make each such payment to each such Subcontractor. If the **City** has received a demand for direct payment from a Subcontractor for any amount which has already been included in a payment to the **Contractor** or which is to be include in a payment to the **Contractor** for payment to the Subcontractor as provided in paragraphs (a) and (b) of M.G.L. c. 30, §39F(1), the **City** shall act upon the demand as provided in M.G.L. c. 30, §39F.

(d) If, within seventy (70) days after the Subcontractor has substantially completed the subcontract Work, the Subcontractor has not received from the **Contractor** the balance due under the subcontract including any amount due for extra labor and materials furnished to the **Contractor**, less any amount retained by the **City** as the estimated cost of completing the incomplete and unsatisfactory items of Work, the Subcontractor may demand direct payment of that

balance from the **City**. The demand shall be by a sworn statement delivered to or sent by certified mail to the **City**, and a copy shall be delivered to or sent by certified mail to the **Contractor** at the same time. The demand shall contain a detailed breakdown of the balance due under the subcontract and also a statement of the status of completion of the subcontract Work. [The demand letter shall indicate the certified mail number assigned by the postal service or the date of delivery to the **Contractor**.] Any demand made after substantial completion of the subcontract Work shall be valid even if delivered or mailed prior to the seventieth day after the Subcontractor has substantially completed the subcontract Work. Within ten (10) days after the Subcontractor has delivered or so mailed the demand to the **City** and delivered or so mailed a copy to the **Contractor**, the **Contractor** may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the **City**, and a copy shall be delivered to or sent by certified mail to the Subcontractor at the same time. The reply shall contain a detailed breakdown of the balance due under the subcontract, including any amount due for extra labor and materials furnished to the **Contractor** and of the amount due for each claim made by the **Contractor** against the Subcontractor.

(e) Within fifteen (15) days after receipt of the demand by the **City**, but in no event prior to the seventieth day after substantial completion of the subcontract Work, the **City** shall make direct payment to the Subcontractor of the balance due under the subcontract, including any amount due for extra labor and materials furnished to the **Contractor**, less any amount (i) retained by the **City** as the estimated cost of completing the incomplete or unsatisfactory items of Work, (ii) specified in any court proceedings barring such payment, or (iii) disputed by the **Contractor** in the sworn reply; provided that the **City** shall not deduct from a direct payment any amount as provided in part (iii) if the reply is not sworn to or for which the sworn reply does not contain the detailed breakdown required by the previous paragraph. The **City** shall make further direct payments to the Subcontractor forthwith after the removal of the basis for deductions from direct payments made as provided in parts (i) and (ii) of this paragraph.

(f) The **City** shall forthwith deposit the amount deducted from a direct payment as provided in part (iii) of the previous paragraph in an interest-bearing joint account in the names of the **Contractor** and the Subcontractor in a bank in Massachusetts selected by the **City** or agreed upon by the **Contractor** and the Subcontractor and shall notify the **Contractor** and the Subcontractor of the date of the deposit and the bank receiving the deposit. The bank shall pay the amount in the account, including accrued interest, as provided in an agreement between the **Contractor** and the Subcontractor or as determined by decree of a court of competent jurisdiction.

(g) All direct payments and all deductions from demands for direct payments deposited in an interest-bearing account or accounts in a bank pursuant to the previous paragraph shall be made out of amounts payable to the **Contractor** at the time of receipt of a demand for direct payment from a Subcontractor and out of amounts which later become payable to the **Contractor** and in the order of receipt of such demands from Subcontractors. All direct payments shall discharge the obligation of the **City** to the **Contractor** to the extent of such payment.

(h) The **City** shall deduct from payments to a **Contractor** amounts that, together with the deposits in interest-bearing accounts pursuant to paragraph (f), are sufficient to satisfy all unpaid balances of demands for direct payment received from Subcontractors. All such amounts shall be earmarked for such direct payments, and the Subcontractors shall have a right in such deductions prior to any claims against such amounts by creditors of the **Contractor**.

(i) If the Subcontractor does not receive payment as provided in paragraph (a) or if the **Contractor** does not submit a periodic estimate for the value of the labor or materials performed or furnished by the Subcontractor and the Subcontractor does not receive payment for same when due less the deductions provided for in paragraph (a), the Subcontractor may demand direct payment by following the procedure in paragraph (d) and the **Contractor** may file a sworn reply as provided in that same paragraph. A demand made after the first day of the month following that for which the Subcontractor performed or furnished the labor and materials for which the Subcontractor seeks payment shall be valid even if delivered or mailed prior to the time payment was due on a periodic estimate from the **Contractor**. Thereafter the **City** shall proceed as provided in paragraphs (e), (f), (g), and (h). "Subcontractor" as used in this paragraph (i)(i) shall mean a person approved by the **City** in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the **Contractor**.

(2) Any assignment by a Subcontractor of the rights under this section to a surety company furnishing a bond under the provisions of M.G.L. c. 149, §29; shall be invalid. The assignment and subrogation rights of the surety to amounts included in a demand for direct payment which are in the possession of the **City** or which are on deposit pursuant to paragraph (g) shall be subordinate to the rights of all Subcontractors who are entitled to be paid under this section and who have not been paid in full.

(3) A **Contractor** or a Subcontractor shall enforce a claim to any portion of the amount of a demand for direct payment deposited as provided in herein by a petition in equity in the superior court against the other and the bank shall not be a necessary party. A Subcontractor shall enforce a claim for direct payment or a right to require a deposit as provided in paragraph (f) by a petition in equity in the superior court against the **City** and the **Contractor** shall not be a

necessary party. Upon motion of any party the court shall advance for speedy trial any petition filed as provided in this paragraph. M.G.L. c. 231, §§59 and 59B shall apply to such petitions. The court shall enter an interlocutory decree upon which execution shall issue for any part of a claim found due pursuant to §§59 and 59B and, upon motion of any party, shall advance for speedy trial the petition to collect the remainder of the claim. Any party aggrieved by such interlocutory decree shall have the right to appeal therefrom as from a final decree. The court shall not consolidate for trial the petition of any Subcontractor with the petition of one or more Subcontractors or the same general contract unless the court finds that a substantial portion of the evidence of the same events during the course of construction (other than the fact that the claims sought to be consolidated arise under the same general contract) is applicable to the petitions sought to be consolidated and that such consolidation will present unnecessary duplication of evidence. A decree in any such proceeding shall not include interest on the disputed amount deposited in excess of the interest earned for the period of any such deposit. No person except a Subcontractor filing a demand for direct payment for which no funds due the **Contractor** are available for direct payment shall have a right to file a petition in court of equity against the **City** claiming a demand for direct payment is premature, and such Subcontractor must file the petition before the **City** has made a direct payment to the Subcontractor and has made a deposit of the disputed portion as provided in part (iii) of paragraph (e) and in paragraph (f).

(4) In any petition to collect any claim for which a Subcontractor has filed a demand for direct payment the court shall, upon motion of the **Contractor**, reduce by the amount of any deposit of a disputed amount by the **City** as provided in part (iii) of paragraph (e) and in paragraph (f) any amount held under a trustee writ or pursuant to a restraining order or injunction.

ARTICLE 14 SUBSTANTIAL COMPLETION

14.1. Substantial Completion.

14.1.1. Upon Substantial Completion of the Work, the **Contractor** shall present in writing to the **City** its certification that the Work has been substantially completed and include in its certification (1) a list of items to be completed or corrected, (2) all special warranties required by the Contract Documents, endorsed by the **Contractor** and in a form reasonably acceptable to the **Design Professional** and (3) the permits and certificates referred to in 13.7.1., or elsewhere. The failure to include any item on the list mentioned in the preceding sentence does not alter the responsibility of the **Contractor** to complete all Work in accordance with the Contract Documents. When the **Design Professional** on the basis of an inspection determines that the Work or designed portion thereof is substantially complete and the other conditions have been met, the **Design Professional** will then prepare a certificate of Substantial Completion which shall establish the date of Substantial Completion, shall state the responsibilities of the **City** and the **Contractor** for security, maintenance, heat, utilities, damage to the Work, and insurance, and shall fix the time within which the **Contractor** shall complete the items listed therein. The certificate of Substantial Completion shall be submitted to the **City** and the **Contractor** for their written acceptance of the responsibilities assigned to them in such certificate.

14.1.2. Within twenty-one (21) days after receipt of the certification from the **Contractor**, the **City** shall present to the **Contractor** either a written declaration that the Work has been substantially completed or an itemized list of incomplete or unsatisfactory work items required by the Contract sufficient to demonstrate that the Work has not been substantially completed. The **City** may include with such list a notice setting forth a reasonable time within which the **Contractor** must achieve Substantial Completion of the Work. If the **City** fails to respond, by presentation of a written declaration or itemized list as aforesaid, to the **Contractor's** certification within the twenty-one (21) day period, the **Contractor's** certification shall take effect as the **City's** declaration that the Work has been substantially completed.

14.2. Partial Use or Occupancy of the Premises.

14.2.1. The **City** may occupy or use any completed or partially completed portion of the Work at any stage. Such partial occupancy or use may begin whether or not the portion is substantially complete, provided that the respective responsibilities of the **City** and the **Contractor** with respect to payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work, insurance, correction of the Work, and warranties shall be established by agreement of the **City** and the **Contractor** or, absent such agreement, shall be determined by the **Design Professional** subject to the right of either party to contest such determination as provided in Article 16.

14.2.2. Immediately prior to such partial occupancy or use, the **City**, the **Contractor** and the **Design Professional** shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

14.2.3. Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

14.2.4. (Reference: M.G.L. c. 30, §39G;). Within sixty-five (65) days after the effective date of a declaration of

Substantial Completion, the **City** shall prepare and send to the **Contractor** for acceptance a Substantial Completion estimate for the quantity and price of the Work done and all but one percent (1%) retainage on that Work, including the quantity, price and all but one percent (1%) retainage for the undisputed part of each item and extra work item in dispute, but excluding the disputed part thereof, less the estimated cost of completing all incomplete and unsatisfactory items and less the total periodic payments made to date for the Work. The **City** shall also deduct from the Substantial Completion estimate an amount equal to the sum of all demands for direct payment filed by Subcontractors and not yet paid to Subcontractors or deposited in joint accounts pursuant to M.G.L. c. 30, §39F.

14.2.5. (Reference: M.G.L. c. 30, §39G). If the **City** fails to prepare and send to the **Contractor** any Substantial Completion estimate required by the provisions herein on or before the date specified, the **City** shall pay to the **Contractor** interest on the amount which would have been due to the **Contractor** pursuant to such Substantial Completion estimate at the rate of three (3) percentage points above the rediscount rate then charged by the Federal Reserve Bank of Boston from such date to the date on which the **City** sends that Substantial Completion estimate to the **Contractor** for acceptance or to the date of payment therefor, whichever occurs first. The **City** shall include the amount of such interest in the Substantial Completion estimate.

14.2.6. (Reference: M.G.L. c. 30, §39G). Within fifteen (15) days after the effective date of the declaration of Substantial Completion, the **City** shall send to the **Contractor** by certified mail, return receipt requested, a complete list of all incomplete or unsatisfactory items, and unless delayed by causes beyond its control, the **Contractor** shall complete all such items within forty-five (45) days after the receipt of such list or before the date for final payment and acceptance, whichever is later. If the **Contractor** fails to complete such Work within such time, the **City** may, subsequent to seven (7) days' written notice to the **Contractor** by certified mail, return receipt requested, terminate the Contract and complete the incomplete or unsatisfactory items and charge the cost of same to the **Contractor**.

14.3. Final Inspection.

14.3.1. Upon written notice from the **Contractor** that the entire Work or an agreed portion thereof is complete, the **Design Professional** will make a final inspection with the **City** and the **Contractor** and will notify the **Contractor** in writing of all particulars which this inspection reveals that the Work is incomplete or defective. The **Contractor** shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

ARTICLE 15 GUARANTEES AND WARRANTIES

15.1. In General.

15.1.1. All guarantees and warranties specifically called for by the Specifications shall expressly run to the benefit of the **City**. Neither the final certificate of payment nor any provision in the Contract Documents, nor partial or entire occupancy of the premises by the **City** shall constitute any acceptance of work not done in accordance with the Contract Documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall remedy any defects in the work and pay for any damage to other work resulting therefrom, which shall appear within a period of one year from the date of final acceptance of the work unless a longer period is specified. CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT) will give notice of observed defects with reasonable promptness.

15.2. Warranties.

15.2.1. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof, unless otherwise provided in the certificate of Substantial Completion.

15.2.2. The **Contractor** warrants that the materials and equipment furnished under the Contract will be new and of recent manufacture unless otherwise specified, and that all Work will be of good quality, free from faults and defects, and in conformance with the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The **Contractor's** warranty excludes remedy for damage or defect caused by abuse, Modifications not executed by the **Contractor**, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by the **Design Professional**, the **Contractor** shall furnish satisfactory evidence as to the kind and quality of material and equipment.

15.2.3. The **Contractor** warrants that title to all Work covered by an application for payment will pass to the **City** either by incorporation in the construction or upon the receipt of payment by the **Contractor**, whichever occurs first, free and clear of all liens. The **Contractor** further agrees that the submission of any application for payment shall conclusively be deemed to waive all liens with respect to said Work to which the **Contractor** may then be entitled, provided that such waiver of the lien rights shall not waive the **Contractor's** right to payment for such Work.

15.2.4. The **Contractor** warrants and guarantees that title to all Work, materials, and equipment covered by any

application for payment, whether incorporated in the Project or not, will pass to the **City** no later than the time of payment free and clear of all liens.

15.2.5. No materials or supplies for the Work shall be purchased by the **Contractor** or Subcontractor subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller. The **Contractor** warrants that it has good title to all materials and supplies used by it in the Work, free from all liens.

15.2.6. The **Contractor** shall indemnify and hold the **City** harmless from all claims growing out of the lawful demands of Subcontractors, laborers, workers, mechanics, material persons, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the furtherance of the performance of this Contract. The **Contractor** shall at the **City's** request, furnish satisfactory evidence that all obligations of the nature hereinabove designated have been paid, discharged, or waived. If the **Contractor** fails to do so, then the **City** may, after having served written notice on the **Contractor** either pay unpaid bills, of which the **City** has written notice, direct, or withhold from the **Contractor's** unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the **Contractor** shall be resumed, in accordance with the terms of this Contract, but in no event shall the provisions of this sentence be construed to impose any obligations on the **City** to either the **Contractor** or its surety. In paying any unpaid bills of the **Contractor**, the **City** shall be deemed the agent of the **Contractor** and any payment so made by the **City** shall be considered as payment made under the Contract by the **City** to the **Contractor** and the **City** shall not be liable to the **Contractor** for any such payment made in good faith.

15.3. Extended Warranties and Guarantees.

15.3.1. Any defective Work that is either corrected or replaced will be warranted and guaranteed for a period of three (3) years from the date of such correction or replacement.

ARTICLE 16 CLAIMS

16.1. In General.

16.1.1. Written Notice. A Claim must be made by written notice to the other party.

16.1.2. Content of Notice. The notice must include all written supporting data.

16.1.3. Burden of Proof. The party making the Claim must substantiate the Claim.

16.2. Time Limits on Claims.

16.2.1. Unless otherwise provided, all Claims must be made within twenty-one (21) days after the occurrence of the event giving rise to such Claim or within twenty-one (21) days after the claimant first recognizes the condition giving rise to the Claim, whichever is later. Any change or addition to a previously made Claim shall be made by a written notice within the twenty-one-day period in order to be valid.

16.3. Continuing Contract Performance.

16.3.1. Pending final resolution of a Claim including arbitration, unless otherwise agreed in writing, the **Contractor** shall proceed diligently with performance of the Contract and the **City** shall continue to make payments in accordance with the Contract Documents.

16.4. Types of Claims.

16.4.1. Claims for Differing Subsurface or Latent Physical Conditions. (Reference: M.G.L. c. 30, §39N). If, during the progress of the Work, the **Contractor** or the **City** discovers that the actual subsurface or latent physical conditions encountered at the Site differ substantially or materially from those shown on the Plans or indicated in the Contract Documents, either the **Contractor** or the **City** may request an equitable adjustment in the Contract Sum of the Contract applying to Work affected by the differing Site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from a **Contractor**, or upon its own initiative, the **City** shall make an investigation of such physical conditions, and if they differ substantially or materially from those shown on the Plans or indicated in the Contract Documents or from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in the Plans and Contract Documents and are of such a nature as to cause an increase or decrease in the cost of performance of the Work or a change in the construction methods required for the performance of the Work which results in an increase or decrease in the cost of the Work, the **City** shall make an equitable adjustment in the Contract Sum and the Contract shall be modified in writing accordingly.

16.4.2. Claims for Additional Cost. If the **Contractor** claims that any acts or omissions of the **City** or the **Design Professional**, including any instructions or orders, whether oral, written, by drawings, or otherwise, involve extra cost or time, and the **Contractor** has not received a written acknowledgment by the **City** or the **Design Professional** that extra payment will

be made or time extended on account thereof, the **Contractor** shall promptly so notify the **Design Professional** in writing of such Claim and shall proceed with the Work relating to such Claim and all rights of both parties with respect to such Claim shall be deemed to have been reserved. No Claim by the **Contractor** on account of such acts, omissions, instructions, or orders shall be valid unless the **Contractor** has so notified the **Design Professional** before proceeding.

16.4.2.1. Under no circumstances shall a Claim be made for additional cost where adverse weather conditions are the basis for the Claim.

16.4.3. Claims for Additional Time. If the **Contractor** wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The **Contractor** shall have the burden of demonstrating the effect of the claimed delay on the Contract Time and shall furnish the **Design Professional** with such documentation relating thereto as the **Design Professional** may reasonably require. Under no circumstances shall the **Contractor** make a Claim for an increase in the Contract Time due to a change in the **Contractor's** early completion date. If the increase in the Contract Time extends beyond the Contract Time established by the **City**, only the time that so extends beyond the Contract Time shall be reviewed and considered. In the case of a continuing delay, only one Claim is necessary.

16.4.3.1. Under no circumstances shall a Claim be made for additional time where adverse weather conditions are the basis for the Claim.

16.4.4. Claims for Injury to Person or Damage to Property. Should either party to the Contract suffer injury to person or damage to property because of any error, omission, or act of the other party or of any of the other party's employees or agents or others for whose acts the other party is legally liable, a Claim will be made in writing to the other party within twenty-one (21) days of the occurrence of the act giving rise to the injury or damage.

16.5. Review of Claims.

16.5.1. Initial Referral. All Claims, the bases of which arise prior to final payment or the earlier termination of the Contract, shall be referred initially to the **Design Professional** for action as provided herein.

16.5.2. Time Period and Action. The **Design Professional** shall review Claims and shall do one of the following within fourteen (14) days of receipt of the Claim:

16.5.2.1. defer any action with respect to all or any part of a Claim for the purpose of requesting and receiving additional information from either party;

16.5.2.2. decline in writing to render a decision for any reason which it deems appropriate (including, but not limited to, the fact that the Claim involves allegations of fault on the part of the **Design Professional**); or

16.5.2.3. render a decision on all or a part of the Claim.

16.5.3. If the **Design Professional** requests additional information, the **Design Professional** shall take action with respect to the Claim no later than fourteen (14) days after receipt of the additional information. The **Design Professional** shall notify the parties in writing of its disposition of such Claim. If the **Design Professional** renders a decision or declines to render a decision, either party may proceed in accordance with paragraph 16.7.

16.6. Decisions.

16.6.1. Decisions by the City or the Design Professional. (*Reference: M.G.L. c. 30, §39P*);). In every case in which this Contract requires the **City**, any official, or its **Design Professional** to make a decision on interpretation of the Specifications, approval of equipment, material or any other approval, or progress of the Work, the decision shall be made promptly and, in any event, no later than fourteen (14) days after the written submission for decision; but if such decision requires extended investigation and study, the **City**, the official, or the **Design Professional** shall, within fourteen (14) days after the receipt of the submission, give the party making the submission written notice of the reasons why the decision cannot be made within the thirty-day period and the date by which the decision will be made.

16.6.2. When Decision of the Design Professional is Final and Binding. The decision of the **Design Professional** shall be final and binding on the parties, unless a party files suit or a demand for arbitration within thirty (30) days after the date of the decision.

16.6.3. When Decision of the Design Professional is Not Final and Binding. (*Reference: M.G.L. c. 30, §39J*). Notwithstanding any contrary provision of this Contract, no decision by the **City** or by the **Design Professional** on a dispute, whether of fact or of law, arising under said Contract shall be final or conclusive if such decision is made in bad faith, fraudulently, capriciously, arbitrarily, is unsupported by substantial evidence, or is based upon error of law.

16.6.4. Resolved Claims. If a Claim is resolved, the **Design Professional** shall obtain or prepare the appropriate documentation and provide the **City** and the **Contractor** with a copy of same.

16.7. Arbitration.

16.7.1. Controversies and Claims Subject to Arbitration. Any controversy or Claim arising out of or related to the

Contract, or the breach thereof, shall be settled by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association, and judgment upon the award rendered by the arbitrator or arbitrators may be entered in any court having jurisdiction thereof, except controversies or Claims relating to aesthetic effect, subject to the provisions of paragraph 16.7.7. In any such arbitration in which the amount stated in the demand is \$100,000 or less, the American Arbitration Association shall appoint a single arbitrator in accordance with such Rules, who shall be a lawyer. In any such arbitration in which the amount stated in the demand is in excess of \$100,000, the demand shall include the name of an arbitrator appointed by the claimant. The respondent shall appoint a second arbitrator and shall notify the claimant in writing of such appointment within thirty (30) days of receipt of the demand, failing which the matter shall be decided by the arbitrator named in the claimant's demand. Within thirty (30) days after the claimant's receipt of notice of the appointment of the second arbitrator, the two arbitrators shall appoint a neutral arbitrator and shall notify the parties in writing of such appointment, failing which either party may apply to the American Arbitration Association to appoint such neutral arbitrator. If such neutral arbitrator is appointed by the American Arbitration Association, he or she shall be a lawyer.

16.7.2. Rules for Arbitration. If the neutral arbitrator is appointed by the American Arbitration Association, the said Association shall administer the arbitration and its Construction Industry Arbitration Rules shall govern all aspects of the proceeding including the enforcement of any award. If the neutral arbitrator is not appointed by the American Arbitration Association, then the panel of arbitrators shall act as the administrator of the arbitration but the Construction Industry Arbitration Rules of the Association shall nonetheless govern all aspects of the proceeding, including the enforcement of any award, provided however that the arbitration panel shall have all of the powers and duties conferred on the Association pursuant to said rules. In addition, the following rules shall govern the selection of arbitrators and the proceedings:

16.7.2.1. Neither party may appoint as arbitrator an employee or an owner of that party, nor the parent, spouse, or child of an employee or owner of that party.

16.7.2.2. After the neutral arbitrator has been appointed, neither party may engage in *ex parte* communication with any arbitrator.

16.7.3. When Arbitration May Be Demanded. Demand for arbitration of any Claim, the basis of which arises prior to final payment or the earlier termination of the Contract may not be made before the earlier of (1) the date on which the **Design Professional** has rendered a written decision on the Claim or has notified the parties in writing that such decision will not be rendered or (2) forty-five (45) days following receipt by the **Design Professional** of a written request for a decision sent by registered or certified mail to both the **Design Professional** and the other party to this Contract.

16.7.3.1. In no event shall a demand for arbitration be made after the date when the institution of legal or equitable proceedings based on such Claim would be barred by the applicable statute of limitations.

16.7.4. Limitation on Consolidation or Joinder. No arbitration arising out of or relating to the Contract Documents shall include, by consolidation or joinder or in any other manner, the **Design Professional**, the **Design Professional's** employees or consultants, except by written consent containing specific reference to the Contract and signed by the **Design Professional**, the **City**, the **Contractor**, and any other person or entity sought to be joined. No arbitration shall include, by consolidation or joinder or in any other manner, parties other than the **City**, the **Contractor**, a separate contractor, and other persons substantially involved in a common question of fact or law whose presence is required if complete relief is to be accorded in arbitration. No person or entity other than the **City**, the **Contractor**, or a separate contractor shall be included as an original third party or additional third party to an arbitration whose interest or responsibility is insubstantial. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of a dispute not described therein or with a person or entity so named or described herein. The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Contract shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

16.7.5. Claims and Timely Assertion of Claims. A party who files a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded. When a party fails to include a Claim through oversight, inadvertence, or excusable neglect, or when a Claim has matured or been acquired subsequently, the arbitrator or arbitrators may permit amendment.

16.7.6. Award Final. The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

16.7.7. The City's Reservation of Rights. Notwithstanding any provision contained in this Article 16 or elsewhere in the Contract Documents, the **City** reserves the following rights in connection with Claims between the **City** and the **Contractor**, which rights may be exercised by the **City** unilaterally, in the **City's** sole discretion, and without the consent of the **Contractor**:

16.7.7.1. the right to institute legal action against the **Contractor** in any court of competent jurisdiction in lieu of demanding arbitration, in which case the dispute or disputes which are the subject of such action shall be decided by such court, and not by arbitration;

16.7.7.2. the right to obtain from any court of competent jurisdiction a stay of any arbitration instituted by the **Contractor**, provided that the application for such stay is made before the appointment of the neutral arbitrator in

such arbitration, in which case the dispute or disputes which are the subject of such arbitration shall be decided by such court and not by arbitration;

16.7.7.3. the right to require the **Contractor** to join as a party in any arbitration between the **City** and the **Design Professional** relating to the Project, in which case the **Contractor** agrees to be bound by the decision of the arbitrator or arbitrators in such arbitration.

16.7.8. In case the **City** elects to proceed in accordance with 16.7.7.1. or 16.7.7.2. above, the word "litigation" shall be deemed to replace the word "arbitration" wherever the latter word appears in the Contract Documents.

ARTICLE 17 EMERGENCIES

17.1. In an emergency affecting the health and safety of persons or property, the **Contractor** shall act to prevent threatened damage, injury, or loss.

17.2. In emergencies affecting the health, safety, or protection of persons, the Work or property at the Site or adjacent thereto, the **Contractor**, without special instruction or authorization from the **City** or the **Design Professional**, is obligated to act to prevent threatened damage, injury, or loss. The **Contractor** shall give the **Design Professional** prompt written notice if the **Contractor** believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby. If the **Design Professional** determines that a change in the Contract Documents is required because of the action taken by the **Contractor** in response to such an emergency, a **Construction Change Directive** or Change Order will be issued to document the consequences of such action.

ARTICLE 18 TERMINATION OR SUSPENSION OF THE CONTRACT

18.1. Suspension by the City.

18.1.1. At any time and without cause, the **City** may suspend the Work or any portion thereof for a period of not more than ninety (90) days by notice in writing to the **Contractor** and the **Design Professional** that will fix the date on which Work will be resumed. The **Contractor** shall resume Work on the date so fixed. The **Contractor** shall be allowed an adjustment in the Contract Sum or an extension of the Contract Time, or both, directly attributable to any such suspension if the **Contractor** makes an approved Claim therefor, provided, however, that if there is a suspension, delay or interruption for fifteen days or more or due to a failure of the Awarding Authority to act within the time specified in this contract, the Awarding Authority shall make an adjustment in the contract price for any increase in the cost of performance of this contract but shall not include any profit to the General Contractor on such increase; and provided further, that the Awarding Authority shall not make any adjustment in the contract price under this provision for any suspension, delay, interruption, or failure to act to the extent that such is due to any cause for which this contract provides for an equitable adjustment of the contract price under any other contract provisions. The General Contractor must submit the amount of a claim under provision (1) to the Awarding Authority in writing as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of final payment under this contract and, except for costs due to a suspension order, the Awarding Authority shall not approve any costs in the claim incurred more than twenty days before the General Contractor notified the Awarding Authority in writing of the act or failure to act involved in the claim. The General Contractor must submit the amount of a claim under provision (1) to the Awarding Authority in writing as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of final payment under this contract and, except for costs due to a suspension order, the Awarding Authority shall not approve any costs in the claim incurred more than twenty days before the General Contractor notified the Awarding Authority in writing of the act or failure to act involved in the claim.

18.1.1.1 Notwithstanding the above, if the City is required to suspend the work as a result of a request from the Office of the Attorney General in connection with a bid protest or an injunction, the Contractor shall not have a claim for damages, but the City shall extend the date of substantial completion for a period of time commensurate with the period of the suspension, and the liquidated damages clause shall not take effect until the extended date of substantial completion. If any of the following occurrences causes a delay in the work, the Contractor shall immediately notify CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT) in writing. If, upon investigation, the City finds that the delay is excusable, the City shall extend the date of substantial completion for a period of time commensurate with the period of the excusable delay, and the liquidated damages clause shall not take effect until the extended date of substantial completion: (1) any acts of the Government, including controls or restrictions upon or requisitioning of materials, equipment, tools, or labor by reason of war, National Defense, or any other national emergency; (2) delays which are caused by the City and which are not occasioned by the Contractor's failure to supply CONTRACTING DEPARTMENT (AS STATED ON THE FIRST PAGE OF THE AGREEMENT) or its design professional with progress schedules, documents, samples, and the like, in a timely manner; (3) causes not reasonably foreseeable by the parties to this Contract, which are beyond the reasonable

control of the Contractor, such as blizzards, floods, hurricanes, tornadoes, and strikes; (4) any delay of any subcontractor resulting from paragraphs (1), (2), or (3).

18.1.2. If the Work is defective, if the **Contractor** fails to provide a sufficient number of skilled workers or suitable materials or equipment, or if the **Contractor** defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven-day period after receipt of written notice from the **City** to begin and prosecute correction of such default or neglect with diligence and promptness, the **City** may correct such deficiencies, without prejudice to other remedies the **City** may have. In such case, an appropriate **Construction Change Directive** shall be issued deducting from payments then or thereafter due to the **Contractor** the cost of correcting such deficiencies including compensation for the **Design Professional's** additional services and expenses made necessary by such default, neglect, or failure and any and all direct, indirect, or consequential costs associated with the order to stop the Work. If such payments then or thereafter due the **Contractor** are not sufficient to cover such amounts, the **Contractor** shall immediately pay the difference to the **City**. The **Contractor** shall remain responsible for maintaining progress and shall not be entitled to any increase in the Contract Time or the Contract Sum.

18.2. Termination by the Contractor.

18.2.1. If, through no act or fault of the **Contractor**, a Subcontractor, or a Sub-subcontractor, the Work is suspended for a period of more than ninety (90) days by the **City**, or under an order of court or other public authority, or the **Design Professional** fails to act on any application for payment within thirty (30) days after it is submitted in proper form and content or the **City** fails for thirty (30) days to pay the **Contractor** any sum finally determined to be due, then the **Contractor** may terminate the Contract upon seven (7) days' written notice to the **City**, provided that the **City** does not remedy such suspension or failure within that time.

18.3. Termination by the City.

18.3.1. If the **Contractor** is adjudged a bankrupt, or if the **Contractor** makes a general assignment for the benefit of the **Contractor's** creditors, or if a receiver is appointed on account of the **Contractor's** insolvency, or if the Contractor makes a written admission of the Contractor's inability to pay debts, or if the Contractor becomes a debtor or defendant in (i) a voluntary or involuntary petition in bankruptcy, (ii) a petition for appointment of a receiver, (iii) a levy of an attachment or execution, (iv) a winding up or dissolution of a partnership or corporation, (v) or any other proceeding under which a court of competent jurisdiction assumes custody or control over the Contractor, or if the **Contractor** persistently or repeatedly refuses or fails, except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials, or fails to prosecute the work with such diligence as will, in the reasonable estimation of the City, ensure substantial completion within the time specified in the Contract Documents, or if the **Contractor** fails to make prompt payment to Subcontractors or for materials or labor, or persistently disregards laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction or disregards an instruction, order, or decision of the **Design Professional**, or otherwise is in breach of any provision of the Contract and has failed to cure such breach after written notice from the City specifying 1) the breach, 2) what must be done to cure the breach, and 3) the time within which the breach must be cured, or otherwise is guilty of substantial violation of any provision of the Contract, then the **Contractor** shall be in default, and the **City** may, without prejudice to any other right or remedy and upon written notice to the **Contractor**, temporarily withhold cash payments pending correction of the deficiency, hold the Contractor and its sureties liable in damages, require the Contractor's sureties to complete the Contract, take possession of all materials, tools, appliances, equipment, construction equipment and machinery and vehicles, offices and other facilities on the Project Site, and all materials intended for the Work, wherever stored, without liability for loss or damage, following which use, the Contractor shall be liable for their removal from the site; and, seven (7) days after such notice, may terminate the employment of the **Contractor**, accept assignment of any or all subcontracts pursuant to Paragraph 6.6.1.1, and finish the Work by whatever method the **City** may deem expedient (including but not limited to using the services of another contractor (in which case the City shall have no obligation to use a competitive process to obtain the lowest contract prices) and look to the Contractor and the Contractor's sureties for the difference between the cost to complete the work and the contract sum hereunder.

The **City** shall be entitled to collect from the **Contractor** all direct, indirect, and consequential damages suffered by the **City** on account of the **Contractor's** default, including without limitation additional services and expenses of the **Design Professional** made necessary thereby. The **City** shall be entitled to hold all amounts due to the **Contractor** at the date of termination until all of the **City's** damages have been established, and to apply such amounts to such damages.

18.3.1.1. **HUD Action.** If the Contractor is in default, HUD and/or any other administering agency named herein may, with or without the consent of the City, cancel, suspend, or terminate this Contract in whole or in part; require the withholding or disallowance all or part of the funding for the project; declare the contractor ineligible for further Government contracts or avail itself of any other remedies available under the law.

18.3.2. (*Reference:* Somerville Municipal Code Chapter 2.117, Section 2.117.110C). In the event the **Contractor** or any of its agents or employees violates any provision of Somerville Municipal Code Chapter 2.117 that is applicable to **City**

contractors in connection with the awarding, administration, or performance of the Contract, the **City** may terminate the Contract.

18.3.3. (a) The City may terminate this Contract without cause, at any time, effective upon the date of termination specified by written notice to the Contractor, in which case, the Contractor shall be compensated for: (1) sums due under this Contract incurred up to the date of termination for all Work performed and accepted by the City up to the termination date, calculated on a percentage completion basis covering the period of time between the last approved application for payment and the date of termination using the progress schedule and schedule of values. The Contractor shall use its best efforts to mitigate any expenses and shall in no event incur any new obligations after the date of termination.

(1) Payment by the City as provided in this section shall be deemed to fully compensate the Contractor for all expenses and those of any consultants, subcontractors and suppliers, directly or indirectly attributable to the termination. Lost profits shall not be payable. Any such termination shall not give rise to any cause of action for damages against the City.

(b) **Contractor's Duties Upon Termination For Convenience.** Upon termination of this Contract without cause, the Contractor shall: (1) immediately stop the Work; (2) stop placing orders and Subcontracts in connection with this Contract; (3) cancel all existing orders and Subcontracts (subject to the City providing notice that it accepts assignment of any or all subcontracts pursuant to Paragraph 6.6.1.1); (4) surrender the site to City in a safe condition; and (5) promptly transfer to City all materials, supplies, work in process, appliances, facilities, equipment and machinery of this Contract, and all work product, plans, drawings, specifications and other information and documents used in connection with Services performed under this Contract. Failure by the Contractor to comply with said duties shall relieve the City of its obligation to compensate the Contractor, as provided for under this section.

ARTICLE 19

AMERICANS WITH DISABILITIES ACT (42 U.S. 12131)

19.1. On July 26, 1994, the Americans with Disabilities Act ("the Act") became effective for employers of fifteen or more employees.

19.2. The Act protects against discrimination on the basis of "disability," which is defined as a physical or mental impairment that substantially limits at least one "major life activity;" or discrimination against an individual who has a record of such impairment; or discrimination against an individual being regarded - even if inaccurately - as having such impairment. The Act also expressly prohibits job discrimination that is based on any individual's relationship or association with a disabled person.

19.3. If the Contractor is subject to the Act, it must comply with its provisions.

ARTICLE 20

WRITTEN NOTICE TO THE PARTIES

20.1. In General.

20.1.1. All written communications from the **Design Professional** to the Contractor shall be copied to the **City**. All written communications from the Contractor to the **Design Professional** shall be copied to the **City**. All written communications from the Contractor to the **City** shall be copied to the **Design Professional**.

20.2. Addresses.

20.2.1. To the City. Written notice to the **City** shall be sent or hand-delivered to:

Mayor
City of Somerville
93 Highland Avenue
Somerville, MA 02143

City Solicitor
Law Department
93 Highland Avenue
Somerville, MA 02143

Director of Contracting Department (as stated on first page of this Agreement)
City Hall
93 Highland Avenue
Somerville, MA 02143

20.2.2. To the Contractor. Both the address given on the bid form upon which the Agreement is founded and the Contractor's office at or near the Site of the Work are hereby designated as places to either of which notices, letters, and other communications to the Contractor shall be certified, mailed, or delivered. Delivery of any notice, letter, or other communication to the Contractor at or depositing same in a postpaid wrapper directed to either place shall be deemed sufficient service thereof upon the Contractor. Written notice shall be deemed to have been duly served on the Contractor if it is sent or hand-delivered to any member or officer of the Contractor. The date of said service shall be the date of such delivery or mailing. The address may be changed at any time by an instrument in writing, executed and acknowledged by the Contractor and delivered to the City and to the Design Professional. Nothing herein contained shall be deemed to preclude or render inoperative the service of any notice, letter, or other communication upon the Contractor personally. Moreover, any notice, letter, or other communication required under the Contract may be served on the Contractor's representative at job meetings. The Contractor shall provide the City with its change of address seven (7) days prior to its effective date.

20.2.3. To the Design Professional. Written notice to the Design Professional shall be sent or hand-delivered to the address appearing on the Project Manual. Written notice shall be deemed to have been duly served on the Design Professional if it is sent or hand-delivered to any member or officer of the Design Professional.

ARTICLE 21 MISCELLANEOUS PROVISIONS

21.1. Governing Law.

21.1.1. This Contract shall be governed by the laws of the Commonwealth of Massachusetts and the United States of America.

21.2. Venue.

21.2.1. Venue for any court action or proceeding shall be Middlesex County in the Commonwealth of Massachusetts only. The Contractor, all Subcontractors, and Suppliers waive any and all jurisdictional and venue defenses.

21.3. Successors and Assigns.

21.3.1. The Contractor shall not assign, in whole or in part, its rights and obligations under the Contract Documents without prior written consent of the City. An assignment without the prior written consent of the City shall not relieve the Contractor of its obligations thereunder.

21.3.2. The City and the Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to the other party hereto and to partners, successors, assigns, and legal representatives of such other party in respect to covenants, agreements, and obligations contained in the Contract Documents.

21.4. Statutory Limitation Period.

21.4.1. It is expressly agreed that the obligations of the Contractor hereunder arise out of contractual duties, and that the failure of the Contractor to comply with the requirements of the Contract Documents shall constitute a breach of contract, not a tort, for the purpose of applicable statutes of limitations and repose. Any cause of action which the City may have on account of such failure shall be deemed to accrue only when the City has obtained actual knowledge of such failure, not before.

21.5. Rights and Remedies.

21.5.1. Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

21.5.2. No action or failure to act by the City, the Design Professional, or the Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing.

21.6 Severability. In the event that any provision of this Agreement is found to be legally unenforceable, the remainder of the Agreement shall remain in full force and effect.

21.7 Conflict of Interest Laws. The City and the Contractor shall comply with all applicable conflict of interest statutes and regulations.

21.8 If this contract is in excess of \$2,000 and is federally funded, the Contractor shall comply with the Copeland "Anti-Kickback Act" (18 U.S.C. 874 and 29 CFR Part 3), and shall not induce any person employed in the construction, completion, or repair of a public building or public work, to give up any part of the compensation to which he would otherwise be entitled.

21.9. EQUAL EMPLOYMENT OPPORTUNITY/NONDISCRIMINATION

- a) the Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, marital status, sexual orientation, national origin, age, disability, Vietnam Era veteran status or because an employee or applicant is a recipient of federal, state, or local public assistance or housing subsidies; and
 - b) the Contractor shall not discriminate, in any stage of the contract from award to completion, in the selection or retention of subcontractors, suppliers, and materialmen, or in the procurement of materials or supplies, or the rental of equipment, on the basis of race, religion, sex, marital status, sexual orientation, national origin, age, disability, Vietnam Era veteran status, or because an individual is a recipient of federal, state, or local public assistance or housing subsidies; and
 - c) the Contractor shall post an equal employment opportunity notice in conspicuous places at the worksite, shall make copies of such notice available to employees and job applicants, and shall send such notice to each labor union or representative of workers with which the Contractor has a collective bargaining agreement or other contract or understanding; and
 - d) the Contractor shall, to the greatest extent feasible, give employment and on-site training opportunities, to lower-income, minority, women, and disabled members of the local community and shall award subcontracts, when possible, to Minority Business Enterprises (MBE) and Women Business Enterprises (WBE).
- e) the contractor shall include language similar to the above in all subcontracts.

END

PART 3: TECHNICAL SPECIFICATIONS

Background

The work included under this contract consists of furnishing labor, materials, and equipment to perform maintenance, on-call repair services, and installation of irrigation systems, water features, drinking fountains, and spigots at various parks, playgrounds and community gardens when the Department of Public Works does not have the available resources to do so. The contract resulting from this Invitation for Bids will be for on-call services, not specific jobs. No minimum amount of work is guaranteed under this Agreement.

Scope of Work

- 1. Spring Start-Up:** The DPW Commissioner or Designee may direct the Contractor to turn on irrigation systems and inspect for proper operation when the Department of Public Works does not have the available resources to do so.
 - a. All irrigation systems will be fully operational no later than **April 1** of each year.
 - b. Manually run each zone and verify adequate water flow and coverage, adjusting individual sprinkler head spray patterns as necessary.
 - c. Clean any screens, filters and strainers and flush as necessary.
 - d. Reset existing sprinkler heads or remove grass obstructions.
 - e. Program irrigation timer/controller in consultation with the DPW Commissioner or Designee. Verify automatic operations of valves via the timer/controller.
 - f. Verify proper operation of rain or system sensors, if present.
 - g. Identify and document any leaks and advise the DPW Commissioner or Designee on system repair and replacement needs.
 - h. The Contractor shall not begin any repairs identified during Spring Start-Up without prior written authorization from the DPW Commissioner or Designee.
- 2. Winterization:** The DPW Commissioner or Designee may direct the Contractor to decommission irrigation systems for the winter season when the Department of Public Works does not have the available resources to do so.
 - a. All irrigation and pressurized water systems will be fully winterized by **November 15** of each year.
 - b. Drain all system components including, but not limited to, lines, piping, spigots and backflow preventers. Blow-down with compressed air as needed to prevent freeze damage.
 - c. Identify and document any leaks and advise the DPW Commissioner or Designee on system repair and replacement needs.
- 3. On-Call Irrigation Repairs**
 - a. The Contractor will perform on-call repair services to irrigation systems at various locations throughout the City of Somerville upon request.
 - b. The DPW Commissioner or Designee may direct the Contractor to begin on-call repairs within twenty-four (24) hours of receiving a written service request.
 - c. The Contractor will provide written quotes for any and all work upon request, according to the hourly labor and supply rates included on the Price Form. Quotes will be presented to the City, in writing, no more than two (2) business days after the needed repair is identified.
 - d. The DPW Commissioner or Designee must authorize any and all work in writing before work can begin. The Contractor will not begin any work that has not been authorized in writing by the DPW Commissioner or Designee, and for which no approved Purchase Order has been issued.
- 4. Emergency Irrigation Repairs**
 - a. An emergency repair will be any repair that the DPW Commissioner or Designee requests to begin between the hours of 4:31 PM and 6:59 AM Monday–Friday, or any time on a Saturday, Sunday or City holiday; OR a repair to be completed within two (2) hours of notification by the City.

- b. In the event of an emergency, the Contractor will present the DPW Commissioner or Designee with a written price estimate before starting any work, according to the hourly labor rates and supply rates included on the Price Form.
- c. Any and all emergency work must be authorized in writing by the DPW Commissioner or Designee before work can begin.
- d. The Contractor's repair technician(s) will arrive at the designated job site no more than two (2) hours after the DPW Commissioner or Designee has requested emergency repair service.
- e. The Contractor will provide emergency contact information including, but not limited to, service email address(es); and an after-hours phone answering service, or a cell phone number that is available twenty-four (24) hours per day, seven (7) days per week. A passive answering machine is not acceptable.

5. Repairs to Pressurized Water Systems

- a. The DPW Commissioner or Designee may request that the Contractor service non-irrigation pressurized water systems such as drinking fountains, splash pads, decorative fountains, and hose spigots.
- b. Repairs to pressurized water systems will be billed according to the hourly labor and supply rates included on the Price Form.
- c. The Contractor will provide written quotes for any and all work costing over \$9,999, according to the hourly labor and supply rates included on the Price Form. Quotes will be presented to the City, in writing, no more than two (2) business days after the needed repair is identified.
- d. The DPW Commissioner or Designee must authorize any and all work in writing before work can begin. The Contractor will not begin any work that has not been authorized in writing by the DPW Commissioner or Designee, and for which no approved Purchase Order has been issued.

Conditions of Work

- 1. All vehicles used by the Contractor to perform services under this contract will be driven on paved surfaces only.
- 2. Any personnel visiting the site will have identifiable markings of the Contractor's company name, valid legal identification, and personal protection equipment (PPE) including fluorescent vest.
- 3. The Contractor will perform its services in coordination with the operations of the City, with DPW personnel and with any other parties engaged by the City at the work sites. The Contractor agrees to coordinate its services with other work and cooperate with other parties as directed by the DPW Commissioner or Designee.

Examination of Premises

Bidders are **required** to visit the grounds of Somerville High School prior to submitting their bid offering. The purpose of the site visit is to acquaint the bidders with all site conditions and components of the irrigation system at SHS.

- 1. A **mandatory** group site visit will be led by the DPW Commissioner or Designee at 1PM on Wednesday, March 11th.
- 2. A bidder's failure to attend the **mandatory** group site visit will result in rejection of the bidder's bid.
- 3. The Contractor will not be relieved from assuming all responsibility for properly estimating the difficulties and the cost of performing the services required by this specification, because of failure to investigate the site conditions or become acquainted with all the information concerning the services to be performed.
- 4. No additional costs will be accepted to accommodate equipment or conditions overlooked during the bid process. The only exception will be if the City of Somerville and the Contractor agree to add additional work to the Scope of Work via negotiated change order.

By submitting a bid, the Contractor certifies that they have familiarized themselves with the sites and all conditions impacting the cost of work. The Contractor will not be relieved from assuming all responsibility for properly estimating the difficulties and the cost of performing the services required by this specification, because of failure to investigate the conditions or become acquainted with all the information concerning the services to be performed.

Protection of Property

The Contractor will take all precautions to protect municipal and private property from injury and be held responsible for all employees or any person or persons, instrument or device directly or indirectly employed by the Contractor. Any corresponding damages will be replaced, repaired, and paid for by the Contractor to the satisfaction of all parties concerned, including the City.

The Contractor will immediately report any and all damages to the DPW Commissioner or Designee.

Quality of Workmanship

All work must be done in a thorough workmanlike manner by fully qualified skilled technicians. The City reserves the right to judge on the quality of workmanship of those bidding based either on work done for the City in the past, or on work done for other companies and/or cities.

Experience/Requirements

1. The Contractor must have been established in the Irrigation trade for at least five (5) years.
2. The Contractor will designate experienced irrigation technician(s) to perform any and all work under this contract.
3. The Contractor must provide at least one (1) reference demonstrating experience with Watertronics systems.
4. The Contractor will respond to emergency calls and will begin work within two (2) hours of notification by the City.
5. The Contractor must be able to commence work as soon as weather and ground conditions permit, as determined by the DPW Commissioner or Designee.
6. State of Massachusetts Prevailing Wages apply.
7. The Contractor and all technicians designated to work under this Contract must have completed at least 10 hours of OSHA approved training in Construction Safety and Health.

Billing and Payment

1. The Contractor will not begin any work that has not been authorized in writing by the DPW Commissioner or Designee, and for which no approved Purchase Order has been issued. The Contractor assumes all risks and financial liability for any services rendered without proper authorization and Purchase Order.
2. The Contractor will be paid per invoice. An invoice will be presented for services performed. This invoice will identify, at a minimum, the work completed, location of the work performed, date and time of the work, DPW personnel who authorized the work, and a City of Somerville issued Purchase Order number. Additionally, it will detail the unit cost and extended cost for each wage/labor category, Contractor cost, applicable markup/discount for parts and/or materials. Prevailing wage rates required.
3. The Contractor will not charge for travel time. Hourly rates will apply only to actual time work is performed on site.
4. All invoices must be submitted via email to the Superintendent of Grounds and to DPWBG@somervillema.gov.
5. The Contractor is responsible for the supply of all materials, supplies and parts needed to properly complete any and all work performed under this contract. The Contractor's own purchase invoices for materials, supplies, parts and rental equipment used for any work must be made available to the City upon request for auditing purposes. The City reserves the right to audit the Contractor's records at any time to verify the original costs of all materials, parts and equipment rental. Failure to cooperate with this request at any time

will result in an immediate termination of the contract, and non-payment for any materials for which the Contractor's original purchase invoice is not made available for audit.

Laws and Regulations

The Contract will comply with all Federal, State and Local Ordinances and Regulations governing the type of work called for in these specifications.

Exhibit A – Locations

Locations may be added to or removed from the Scope of Work via negotiated change order, as needed.

	Buildings	Address	Irrigation	Other
1	Capuano School	150 Glen St.	See Capuano Field, below	
2	Department of Public Works Complex	1-17 Franey Rd.	2 drip zones	
3	East Branch Library	115 Broadway	4 zones	
4	East Somerville Community School	50 Cross St./115 Pearl St.	10 zones	Drinking fountain
5	Healey School	5 Meacham St.	22 zones	Drinking fountain
6	Kennedy School	5 Cherry St./75 Elm St.	7 zones	1 spigot
7	Central Library, Central Hill, Somerville High School, City Hall	79-93 Highland Ave. (bounded by Highland Ave. to the SW, Medford St./Community Path to the NE, Walnut St. to the SE and School St. to the NW)	44 zones	Cistern, 1 spigot
8	West Branch Library	40 College Ave.	5 zones	
9	Winter Hill Community School	115 Sycamore St.	N/A	Drinking fountains (2)

	Athletic Fields	Address	Irrigation	Drinking Fountain	Hose/ Spigot
1	Capuano Field	150 Glen St.	12 zones	Y	
2	Conway Field	560 Somerville Ave.	2 zones		
3	Dilboy Auxiliary Fields – under construction, scheduled to open 2026	110 Alewife Brook Parkway	40 zones (estimated)	Y	
4	Hodgkins-Curtin Park	Holland St. & Simpson Ave.	8 zones	Y	
5	Nunziato Field & Dog Park	7 Putnam St.	5 zones		2 spigots
6	Trum Field	546 Broadway	23 zones	Y	

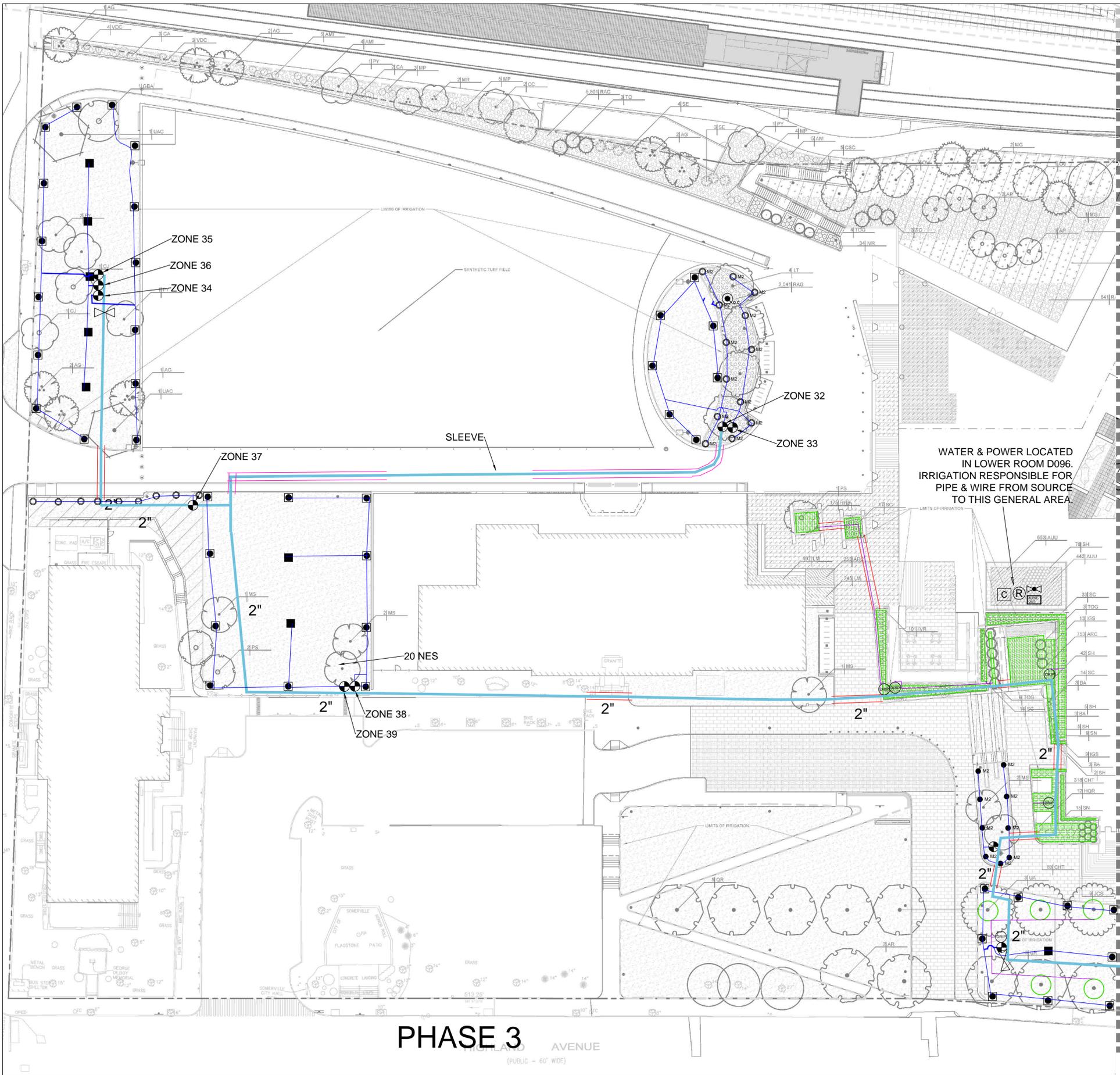
	Traffic Islands	Location	Irrigation	Water Feature
1	Bow St. Island	Bow St. & Summer St.	1 zone	
2	Broadway Islands (23)	Broadway from Powder House Rotary to Lombardi St.	50 zones	
3	Concord Ave. Island	Concord Ave. & Newton St.	5 zones	
4	Davis Square Island	Small triangular island between Dover St. & Day St.	1 zone	
5	McGrath Island	Broadway between McGrath Highway & Garfield Ave.	4 zones	
6	Powder House Island	Center of Rotary at Broadway, College Ave., Powder House Blvd. & Warner St.	8 zones	Fountain
7	Rosebud Island	Elm St. & Summer St. in Davis Square	1 zone	
8	Teele Square Island	Broadway & Holland St.	1 zone	

9	Union Square Bump-Outs	Somerville Ave. between Bow St. & Washington St.	Y	
10	Union Square Island	Intersection of Bow St., Somerville Ave. & Warren Ave.	3 zones	

	Parks & Playgrounds	Address	Irrigation	Water Feature	Drinking Fountain	Hose/ Spigot
1	Albion Street Playground	Albion St.	4 zones	Splash Pad	Y	1 spigot
2	Central Hill Playground	79 Highland Ave.	N/A	Splash Pad	Y	
3	Chuckie Harris Park	17 Cross St. E	12 zones	Splash Pad	Y	1 spigot
4	Conway Park	560 Somerville Ave.	N/A	Splash Pad	Y	
5	Corbett Park	Munroe St. & Prospect Hill Parkway	N/A	Splash Pad	Y	
6	Deanna Cremin Playground	59 Otis St.	3 drip zones	Splash Pad	Y	
7	Dickerman Playground	33-47 Craigie St.	10 zones	Splash Pad	Y	
8	Ed Leathers Park	98 Walnut St.	22 zones		Y	
9	Florence Playground	13 Florence St.	N/A	Splash Pad	Y	
10	Grimmons Park	Governor Winthrop Rd.	4 zones	Splash Pad	Y	
11	Henry Hansen Park	70 Partridge Ave.	3 zones		Y	
12	Hodgkins-Curtin Park	Holland St. & Paulina St.	N/A	Water Wheel	Y	
13	Hoyt-Sullivan Playground	115 Central St.	4 zones	Water Wheel	Y	
14	Ken Kelly Park	217 Somerville Ave.	4 zones	Splash Pad	Y	
15	Kenney Park	388 Highland Ave.	5 zones	Splash Pad	Y	
16	Lexington Park	45 Lexington Ave.	N/A	Splash Pad	Y	
17	Lincoln Park – Irrigation system not included.	290 Washington St.	Not included	Splash Pad	4	2 spigots
18	Lou Ann David Park	1060 Broadway	8 zones		Y	
19	Milk Row Cemetery	430 Somerville Ave.	N/A			1 spigot
20	Morse-Kelley Park	Summer St. & Craigie St.	N/A		Y	2 spigots
21	North Street Playground	14 North St.	5 zones	Splash Pad	Y	
22	Osgood Park	1 Osgood St.	N/A	Splash Pad	Y	2 spigots
23	Palmacci Park	19 Skehan St.	N/A		Y	
24	Perkins Playground	Perkins St. at Perkins Pl.	N/A	Splash Pad	Y	
25	Perry Park	355 Washington St.	23 zones		Y	
26	Powder House Park	850 Broadway	14 zones			
27	Prospect Hill Park	68 Munroe St.	22 zones		Y	
28	Quincy Street Open Space	14 Quincy St.	N/A			1 spigot
29	Seven Hills Park	East of Buena Vista Rd.	10 zones			

30	Somerville Junction Park	2 Woodbine St.	10 zones w/ battery powered controllers	Y	Active rain sensor
31	Somerville Veterans Cemetery	1323 Broadway	1 zone		
32	Statue Park	College Ave. & Davis Sq.	2 zones	Y	
33	Stone Place Park	8 Stone Pl.	6 zones		1 spigot
34	Symphony Park	46 Pearl St.	6 zones	Splash Pad	Cistern, 1 spigot
35	Trum Tot-Lot	Franey Rd.	N/A	Splash Pad	Y
36	Walnut St. Park	16 Walnut St.	N/A	Splash Pad	Y
37	Woodstock St. Playground	18 Woodstock St.	N/A	Splash Pad	Y
38	New Washington St. Dog Park	0 New Washington St.	12 zones	Y	

	Community Gardens	Address	Drinking Fountain	Hose/ Spigot
1	Albion Street Garden	109 Albion St.		1 spigot
2	Allen Street Garden	30 Allen St.	Y	2 spigots
3	Capuano Garden	74 Franklin St.		10 spigots
4	Community Path Garden	22 Vinal Avenue		2 spigots
5	Durrell Garden	Beacon St.		3 spigots
6	Giles Park Garden	16 Walnut St.		1 spigot
7	Morse-Kelley Park Garden	186 Summer St.		1 spigot
8	South Street Farm	138 South St.		4 spigots



LEGEND FOR IRRIGATION PHASE 3

Quantity	Symbol	Pipe
1200'		PVC MAIN: CLASS 200 2" SW PVC PIPE W/ WIRE
700'		PVC MAIN: CLASS 200 1 1/2" SW PVC PIPE W/ WIRE
3600'		DRIPPERLINE: NETAFIM TLDL-6-12, 18" ROW, STAPLE EVERY 2'
600'		POLY LATERALS FOR DRIP: 100 PSI 1" POLY PIPE
500'		POLY LATERALS: 100 PSI 1 1/4" POLY PIPE
2700'		POLY LATERALS: 100 PSI 1" POLY PIPE
380'		PVC SLEEVES: CLASS 200 4" PVC PIPE
2000'	(no symbol)	WIRE: #14/2 UF, GROUND EVERY 500'

* PIPE & WIRE QUANTITIES ARE ROUNDED TO THE NEAREST ROLL OR LENGTH.

Quantity	Symbol	Equipment
20, 4	(no symbol)	DECODERS: HUNTER DUAL-1 & DUAL-S W/ 8" Gnd. ROD W/ 15' #6 COPPER
14		ZONE VALVE: HUNTER PGV-101G 1" W/ DECODER
6		DRIP VALVE: HUNTER PCZ-101-40 1" W/ DECODER
2		ISOLATION VALVES: BRASS GATE VALVE, LINE SIZED
2		QUICK COUPLER VALVE: HUNTER 1" HQ-44 W/ HK-44 KEY
2	(no symbol)	MOISTURE SENSORS: BASELINE BL-WTS100KIT

Quantity	Symbol	Sprinkler Heads
11		MEDIUM ROTARY SPRINKLER: HUNTER PGP-04-5, FULL CIRCLE
51		MEDIUM ROTARY SPRINKLER: HUNTER PGP-04-2.5, ADJUSTABLE
13		SPRAY HEAD: HUNTER PROS-12-MP2000
7		SPRAY HEAD: HUNTER PROS-04-12A
14		SPRAY HEAD: HUNTER PROS-04-8A
2		SPRAY HEAD: HUNTER PROS-04-SS530
7		SPRAY HEAD: HUNTER PROS-04-RCS515
28		SPRAY HEAD: HUNTER PROS-04-MP2000

NOTES FOR IRRIGATION

- 1) SYSTEM IS DESIGNED FOR UP TO 24 GPM PER ZONE & 50 GPM FROM THE WATER SUPPLY. PRESSURE REQUIRED IS 75 PSI MINIMUM.
WATER SUPPLY: 2" @ 75 PSI, BY OTHERS
BACKFLOW: 2" RPZD W/ DRAIN AT SPILLWAY TO FLOOR OR SINK DRAIN ON COPPER, BY OTHERS
POWER: 115 VAC GFCI DEDICATED OUTLET, BY OTHERS
SLEEVES: ALL 4" CL 200 PVC, BY OTHERS
- 2) FOLLOW ALL MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- 3) DESIGN IS DIAGRAMMATIC. INSTALLER SHALL FIELD LOCATE ALL ITEMS WITHOUT COMPROMISING THE INTEGRITY OF THIS DESIGN. ANY CHANGES TO THE NUMBER OF HEADS OR VALVES, OR TO THE HYDRAULICS SHALL BE SUBMITTED TO THE ARCHITECT PRIOR TO THE COMMENCEMENT OF WORK. PIPE ROUTING, HEAD AND VALVE PLACEMENT SHALL BE THE RESPONSIBILITY OF THE INSTALLER, USING THIS DESIGN AS A GUIDE.
- 4) AVERAGE RUN TIMES PER ZONE TO ACHIEVE 1" OF WATER PER WEEK IS AS FOLLOWS:
ROTARY & MP: 30 MINUTES PER DAY (MINIDAY); SPRAY: 15 MINIDAY; DRIP: 30 MINIDAY.
END USER SHALL PROPERLY ADJUST RUN TIMES FOR CHANGING FIELD AND SEASONAL CONDITIONS.
- 5) IRRIGATION INSTALLER IS RESPONSIBLE FOR, BUT NOT LIMITED TO THE COMPLETE INSTALLATION OF THIS IRRIGATION SYSTEM. FOLLOW ALL APPLICABLE CODES AND LAWS. CONTACT A UTILITY MARKING COMPANY PRIOR TO THE COMMENCEMENT OF WORK. IRRIGATION WORK TO INCLUDE ATTACHING TO THE WATER SUPPLY, VERIFYING THE PRESSURE, CONTROLLER INSTALLATION, RAIN SENSOR INSTALLATION, VALVES, SPRINKLERS, DRIP, PIPE & WIRE, AND RELATED ITEMS.

**PER ARCHITECT NOTE:
SOME AREAS SUBJECT TO CHANGE.**



SOMERVILLE HS
SOMERVILLE, MASSACHUSETTS

PROJECT:

REVISIONS		
NO.	DATE	DESCRIPTION

PROJECT NO: 217504-AB	DRAWN BY: ELB
DATE: Aug 30, 2024	SCALE: 1"=30'
PLAN: Irrigation Plan	

SHEET NO:
IR-2

Submittal #32 84 00- 6 Contains the following:

Irrigation Controller Product Data

JOB #:217068

JOB NAME: Somerville High School

SUBMITTAL #: 08 91 19-11

SUBMITTAL NAME: irrigation Controller Product Data

REVIEWED BY: MN

DATE REVIEWED: 10/2/20



REVIEWED



REVIEWED



**REVISE &
RESUBMIT**



REJECTED

AS NOTED

THE REVIEW OF THIS SUBMITTAL BY SUFFOLK CONSTRUCTION, INC. DOES NOT RELIEVE THE SUBCONTRACTOR OR SUPPLIER OF THEIR RESPONSIBILITY FOR THE QUANTITY, OR ACCURACY OF THIS WORK HEREIN REPRESENTED, OR ANY DEVIATION FROM THE PLANS, SPECIFICATIONS, AND CONTRACT.



I-CORE®

Flow monitoring and two-wire capabilities make I-Core an ideal fit for standalone midsize commercial and high-end residential projects.

KEY BENEFITS

- Number of stations:
 - Conventional: 6 to 30 (plastic), 6 to 42 (metal and pedestals)
 - With DUAL® decoder: up to 48
- 4 independent irrigation programs (8 start times each) allow for customized scheduling
- 12-hour maximum station run time provides flexibility for lower-flow zones
- Any 2 programs can operate simultaneously for more efficient watering
- Sensor inputs:
 - 2 (plastic)
 - 3 (metal and pedestals)
- 1 P/MV output for pump start relay and master valve activation
- Flow-monitoring capabilities provide real-time water usage data
- Programmable No Water Window prevents all irrigation for a specified time frame
- High-visibility, backlit display with 6 selectable languages

OPERATING SPECIFICATIONS

- Transformer input: 120/230 VAC
- Transformer output (24 VAC): 1.4 A
- Station output (24 VAC): 0.56 A
- P/MV output (24 VAC): 0.28 A
- Approvals: Plastic Wall Mount IP44, Metal IP56, Plastic Pedestal IP34, NEMA 3R, UL, cUL, FCC, CE, RCM
- Warranty period: 5 years



Plastic Wall Mount

Height: 11"
Width: 13¼"
Depth: 6¼"

Metal Wall Mount

(gray or stainless steel)
Height: 12¾"
Width: 15½"
Depth: 6½"



Plastic Pedestal

Height: 39"
Width: 24"
Depth: 17"



Metal Pedestal

(gray or stainless steel)
Height: 36"
Width: 15½"
Depth: 5"

I-CORE	
Model	Description
IC-600-PL	Base 6-station controller, indoor/outdoor, plastic cabinet
IC-600-M	Base 6-station controller, indoor/outdoor, metal cabinet
IC-600-PP	Base 6-station controller, indoor/outdoor, plastic pedestal
IC-600-SS	Base 6-station controller, indoor/outdoor, stainless steel cabinet
ICM-600	6-station plug-in expansion module
ACC-PED	Metal pedestal, gray powder-coated, for use with I-Core and ACC metal controllers
PED-SS	Stainless steel pedestal for use with I-Core and ACC stainless steel controllers

DUAL	
Model	Description
DUAL48M	DUAL decoder output module, up to 48-stations maximum
DUAL-1	DUAL 1-station decoder (includes 2 DBRY-6 connectors)
DUAL-2	DUAL 2-station decoder (includes 2 DBRY-6 connectors)
DUAL-S	DUAL surge arrester (includes 4 DBRY-6 connectors)

Compatible with:



**Solar Sync
Sensor**
Page 136



DUAL Decoder
Page 125



**Flow-Sync
Sensor**
Page 138
WFS Sensor
Page 139



EPA WaterSense

Add the WaterSense-labeled Solar Sync sensor to improve the water efficiency of this controller.

GRASSESCHI

Plumbing & Heating, Inc.
1299 Grafton Street
Worcester, Ma. 01604

Fax: 508-799-4953
Phone: 508-753-3028

LETTER OF TRANSMITTAL

To: Suffolk Construction

Date: 3/14/22

Project: Somerville High School

Submittals Transmitted:

PR #316 - Irrigation Solenoid Package & Timer

Signed: Peter Rogers

JOB #: 217068
JOB NAME: SOMERVILLE HIGH SCHOOL
SUBMITTAL #: 32 84 00 - 7.0
SUBMITTAL NAME: PR#316 IRRIGATION SOLENOID & TIMER PD
REVIEWED BY: KR
DATE REVIEWED: 3/14/2022



REVIEWED



REVIEWED



REVISE &



REJECTED

AS NOTED RESUBMIT

THE REVIEW OF THIS SUBMITTAL BY SUFFOLK CONSTRUCTION, INC. DOES NOT RELIEVE THE SUBCONTRACTOR OR SUPPLIER OF THEIR RESPONSIBILITY FOR THE QUANTITY, OR ACCURACY OF THIS WORK HEREIN REPRESENTED, OR ANY DEVIATION FROM THE PLANS, SPECIFICATIONS, AND CONTRACT.



IRRIGATION SOLENOID PACKAGE

PGV ASV 1" PGV & PGV JAR TOP PGV ICV **IBV** ACCU SYNC® QUICK COUPLERS

IBV

Size: **1", 1½", 2", 3"**
Flow: **0.1 to 300 GPM**

FEATURES

- Factory-installed Filter Sentry™ diaphragm
- External and internal manual bleed allows quick and easy "at the valve" activation
- Double-beaded diaphragm seal design assures leak-free performance
- Fabric reinforced EPDM diaphragm and EPDM seat ensure superior performance in all conditions
- Optional DC latching solenoids enable Hunter's battery-powered controllers
- Low flow capability allows use of Hunter's micro irrigation products
- Encapsulated 24 VAC solenoid with captive plunger for hassle-free service
- Temperature rating: 150° F
- Warranty period: 5 years
- ▶ Heavy-duty flow control
- ▶ Accu Sync® pressure regulation

OPERATING SPECIFICATIONS

- Flow:
 - IBV-101G-FS: 0.1 to 40 GPM
 - IBV-151G-FS: 20 to 150 GPM
 - IBV-201G-FS: 40 to 200 GPM
 - IBV-301G-FS: 150 to 300 GPM
- Recommended pressure range: 20 to 220 PSI

SOLENOID SPECIFICATIONS

- 24 VAC solenoid
- 350 mA inrush, 190 mA holding, 60 HZ
- 370 mA inrush, 210 mA holding, 50 HZ

FACTORY INSTALLED OPTIONS

- DC latching solenoid

USER INSTALLED OPTIONS

- Solenoid conduit cover (P/N 464322)
- DC latching solenoid (P/N 458200)
- Accu Sync pressure regulator
- Reclaimed water ID tag (P/N 700392)
- ▶ = Advanced Feature descriptions on page 109



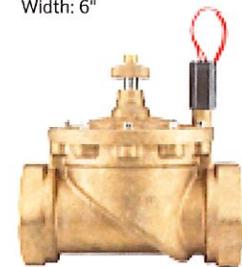
IBV-101G-FS
Inlet Diameter: 1"
Height: 4½"
Length: 3½"
Width: 5¼"



IBV-151G-FS
Inlet Diameter: 1½"
Height: 6¼"
Length: 5¼"
Width: 6"



IBV-201G-FS
Inlet Diameter: 2"
Height: 6"
Length: 5¼"
Width: 7"



IBV-301G-FS
Inlet Diameter: 3"
Height: 9"
Length: 9"
Width: 7¼"

Filter Sentry



IBV PRESSURE LOSS IN PSI

Flow GPM	1" Globe	1½" Globe	2" Globe	3" Globe
0.1	2.0			
0.5	2.0			
1	2.0			
5	2.5			
10	3.0			
15	3.0			
20	3.0	1.5		
30	4.0	1.5		
40	7.0	1.7	0.8	
50		2.2	1.2	
60		3.0	1.7	
75		3.9	2.4	
90		5.5	3.2	
100		7.0	4.2	
120		10.9	6.5	
135		12.7	7.9	
150		16.2	9.8	2.5
175			13.3	3.0
200			17.7	4.1
225				5.3
250				6.7
275				8.3
300				10.1

Note:
Charts based on full-open flow control position

IBV - SPECIFICATION BUILDER: ORDER 1 + 2 + 3 + 4

1 Model	2 Inlet/Outlet	3 Options (Factory Installed)	4 Options (User Installed)
IBV-101G-FS = 1" Globe valve IBV-151G-FS = 1½" Globe valve IBV-201G-FS = 2" Globe valve IBV-301G-FS = 3" Globe/Angle valve	(blank) = NPT threads	(blank) = No option DC = DC latching solenoid	(blank) = No option R = Reclaimed water ID tag CC = Solenoid conduit cover DC = DC latching solenoid AS-ADJ = Accu Sync adjustable pressure regulator AS-xx* = Accu Sync pressure regulator. 20 * = 20 PSI, 30 * = 30 PSI, 40 * = 40 PSI, 50 * = 50 PSI, 70 * = 70 PSI

VALVES

SOLENOIDS

Type: AC and DC-Latching Solenoids

ACCESSORIES Heavy-duty Hunter 24 VAC or latching solenoids provides dependable operation and long life performance.

Key Benefits

- Compatible with all Hunter irrigation valves
- Energy-efficient, low-power design
- Engineered with ultra-durable, heavy-duty materials for maximum longevity
- Stops water intrusion and protects critical electrical components
- Pre-wired with 18" of valve-control wire
- Captive plunger offers easy servicing of solenoid
- Manual quarter-turn on/off control
- Easy installation with no tools required

Electrical Specifications

606800

- Minimum opening/operating voltage: 19 VAC
- Maximum recommended voltage: 28 VAC
- Current at 24 VAC:
 - 350 mA inrush, 190 mA holding, 60 Hz
 - 370 mA inrush, 210 mA holding, 50 Hz
- Maximum operating pressure: 220 PSI
- Wire leads: 18' of 18 AWG UL-approved wire

458200

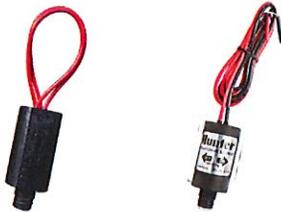
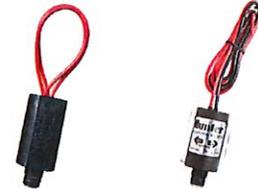
- Minimum opening/operating voltage: 6 VDC
- Maximum recommended voltage: 9 VDC
- Coil resistance: 4.8 ohms nominal
- Maximum operating pressure: 200 PSI
- Wire leads: 18' of 18 AWG black and red UL-approved wire



AC Solenoid
Height: 2¾"
Width: 1"
Depth: 1"



DC-Latching Solenoid
Height: 2¾"
Width: 1"
Depth: 1"



Model	Description
606800	AC Solenoid for all Hunter irrigation valves <small>*All PGV, ICV, and IBV valves come factory-installed with AC solenoid #606800. Use for replacement or retrofits.</small>
458200	DC-latching solenoid for all Hunter irrigation valves

User-Installed Options

Model	Description
NODE	
NODE-200	2-station controller (DC-Latching Solenoid ordered separately)
NODE-400	4-station controller (DC latching solenoid ordered separately)
NODE-600	6-station controller (DC latching solenoid ordered separately)
NODE-BT	
NODE-BT-200	2-station Bluetooth battery controller
NODE-BT-400	4-station Bluetooth battery controller
XC Hybrid	
XCH-600	6-Station indoor/outdoor controller
XCH-1200	12-Station indoor/outdoor controller
XCH-600-SS	6-Station outdoor controller, stainless steel
XCH-1200-SS	12-Station outdoor controller, stainless steel
XCH-600-SSP	6-Station outdoor controller, stainless steel, solar
XCH-1200-SSP	12-Station outdoor controller, stainless steel, solar

ACCU SYNC®

Gain unparalleled pressure regulation for any Hunter valve.

Operating Specifications:

- Regulation from 20 to 100 PSI
- Required dynamic pressure differential: 15 PSI
- Works with any Hunter valve
- Static pressure: 150 PSI
- Works with AC- and DC-latching solenoids
- Warranty period: 2 years



Type: Pressure Regulator



AS-ADJ
Adjustable 20-100 PSI
Height with solenoid:
4½"



SOLENOID ADAPTER
* Included with all Accu Sync models



AS-30
Fixed 30 PSI
Height with solenoid:
3¼"



AS-40
Fixed 40 PSI
Height with solenoid:
3¼"



Model	Description
→ ACCUSYNC-ADJ	Adjustable 20-100 PSI
ACCUSYNC-30	Fixed 30 PSI
ACCUSYNC-40	Fixed 40 PSI

SRV-100	5 to 40
PGV-100/101	5 to 40
PGV-151	20 to 120
PGV-201	40 to 150
ICV-101	5 to 40
ICV-151	20 to 150
ICV-201	40 to 200
ICV-301	150 to 300
IBV-101	5 to 40
IBV-151	20 to 150
IBV-201	40 to 200

NODE

TIMER

CONTROLLERS This battery-powered, waterproof controller offers automatic irrigation control for temporary irrigation and sites without electricity.

Key Benefits

Number of stations:

- 1, 2, 4, or 6
- Battery-operated controller for automatic irrigation without AC power
- Battery-life indicator for battery replacement
- Waterproof enclosure seal protects against water ingress
- 3 flexible programs with 4 start times each and up to 6-hour run times
- Suspend irrigation up to 99 days during the off-season
- Easy Retrieve™ memory backs up the full irrigation schedule if ever changed
- Seasonal adjustment for quicker schedule adjustments without changing run times
- Solar panel provides maintenance-free operation
- Mounts to Hunter solenoids, pipes, flat surfaces, or inside the valve box

Operating Specifications

- One or two 9V alkaline batteries or 1800 mAh solar panel with charging cell
- Operates Hunter DC-latching solenoids (P/N 458200)
- 100' maximum wire runs, 18 AWG wire only
- Station output: 9–11 VDC
- P/MV output: 9–11 VDC (multi-station models)
- Sensor inputs: 2 (wired soil plus wired rain, freeze, or wind only)
- Approvals: IP68 (submersible), UL, cUL, FCC, CE, RCM, ISED
- Warranty period: 2 years



Number of Stations: 1, 2, 4, 6
Type: Battery Operated, Fixed



NODE-100
Diameter: 3½"
Height: 2½"

NODE-100-LS, NODE-200, NODE-400, NODE-600



NODE-100-VALVE



SPNODE (Optional Solar Panel Kit)

Height: 3¼"
Width: 3"
Depth: 5/8"

Model	Description
NODE-100-LS	Single station controller (DC latching solenoid ordered separately)
NODE-100	Single station controller (DC latching solenoid included)
NODE-200	2-Station controller (DC latching solenoid ordered separately)
NODE-400	4-Station controller (DC latching solenoid ordered separately)
NODE-600	6-Station controller (DC latching solenoid ordered separately)
NODE-100-VALVE	Single station controller with PGV-101G valve and DC latching solenoid (NPT threads)

User-Installed Options

Model	Description
458200	DC latching solenoid
SPNODE	Solar Panel kit for Node

Compatible Sensors

RAIN-CLIK	Wired Rain-Clik sensor
RFC	Wired Rain Freeze Clik
MINI-CLIK	Rain Sensor with wall mount
FREEZE-CLIK	Freeze sensor interrupts irrigation when temperatures drop below 37° F
WIND-CLIK	Wind sensor interrupts or returns irrigation when programmed wind speed is measured.

* Specify separately



4475 Alicia Lane
Cumming, GA 30028
678 771 0091
Russ@rainharvest.com

**Rainwater Harvesting Systems
Submittal For:**

Somerville High School

Contractor:

**The Dow Company
1112 Broadway Rd.
Dracut, MA
(978) 682-1414**

~~2/12/19 Revision~~

4/3/19 Revision - Revision
includes reconfigured "Tank
#2"

RAINWATER PRE-FILTER

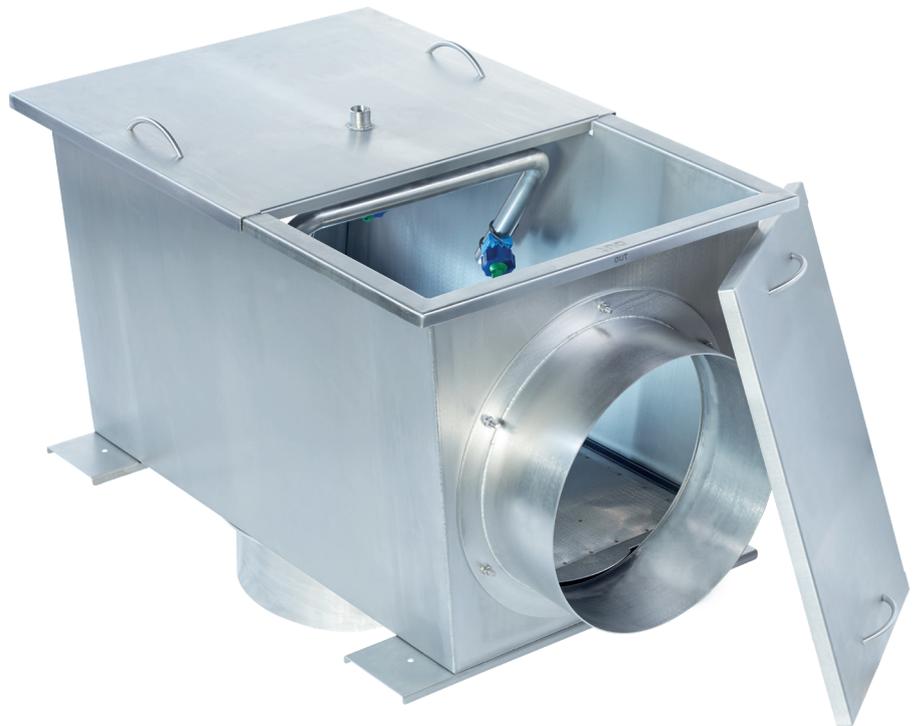


Optimax XXL

GRAF industrial filter technology

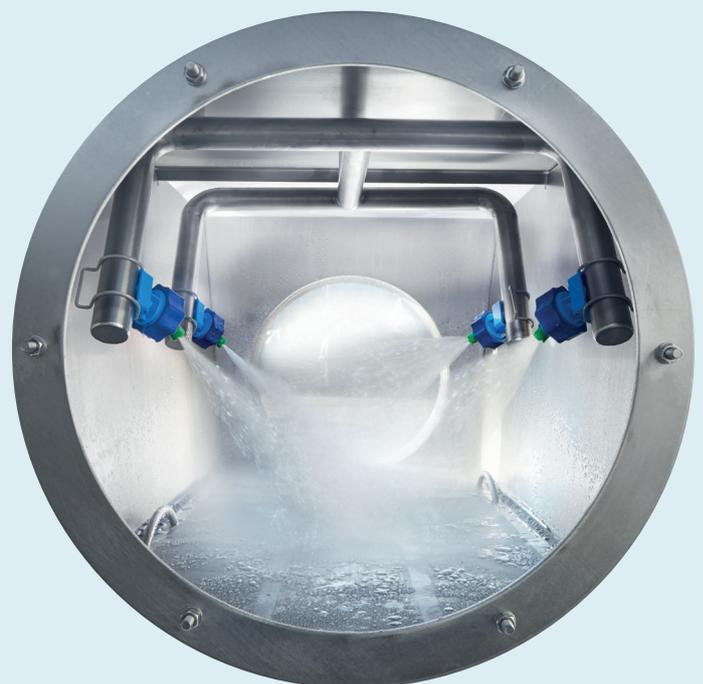
Optimax XXL industrial filter external

- Provides over 95 % water yield
- Self-cleaning filter principle
- Stainless steel filter insert, mesh width 0.35 mm/0.01"
- For roof areas up to 6,000 m²/65,000 ft²
- Patented filter technology
- Flexible connection possibilities (DN 250/DN 300/DN 400 10"/12"/16")
- Height offset between inlet and outlet only 45 mm/1.7"
- Cleaning unit included



Article outline

Description	Order no.
Optimax XXL industrial filter external DN 250/DN 300/DN 400 (10"/12"/16")	340096
Connection kit 10"	340104
Connection kit DN 300	340097
Connection kit 12"	340098
Connection kit DN 400	340099
Connection kit 16"	340100

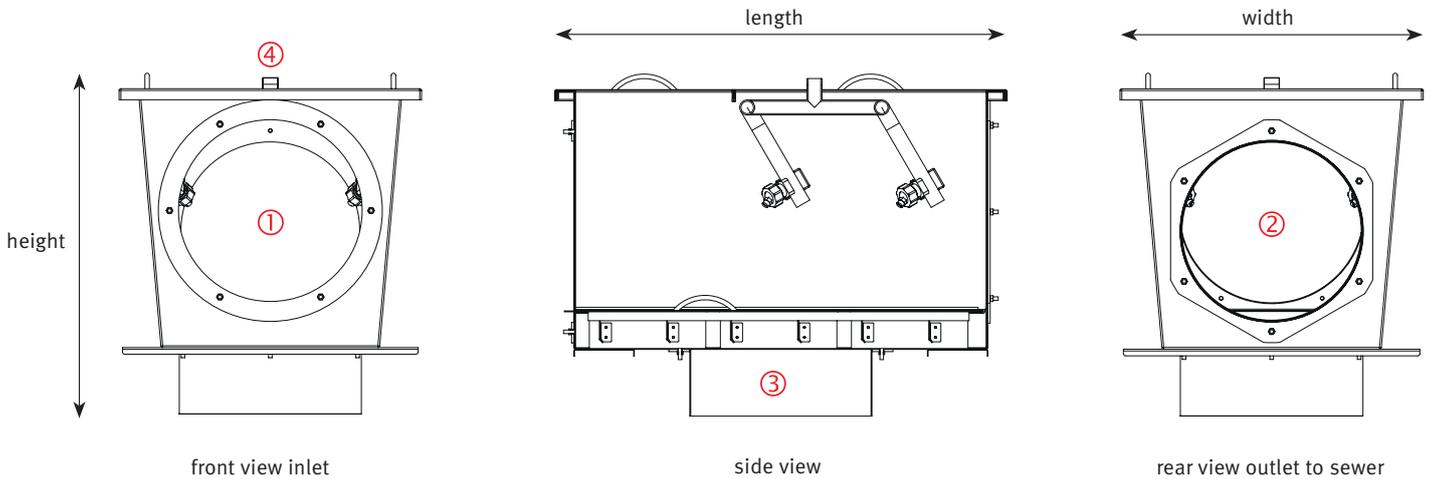




Optimax XXL

GRAF industrial filter technology

Measurements

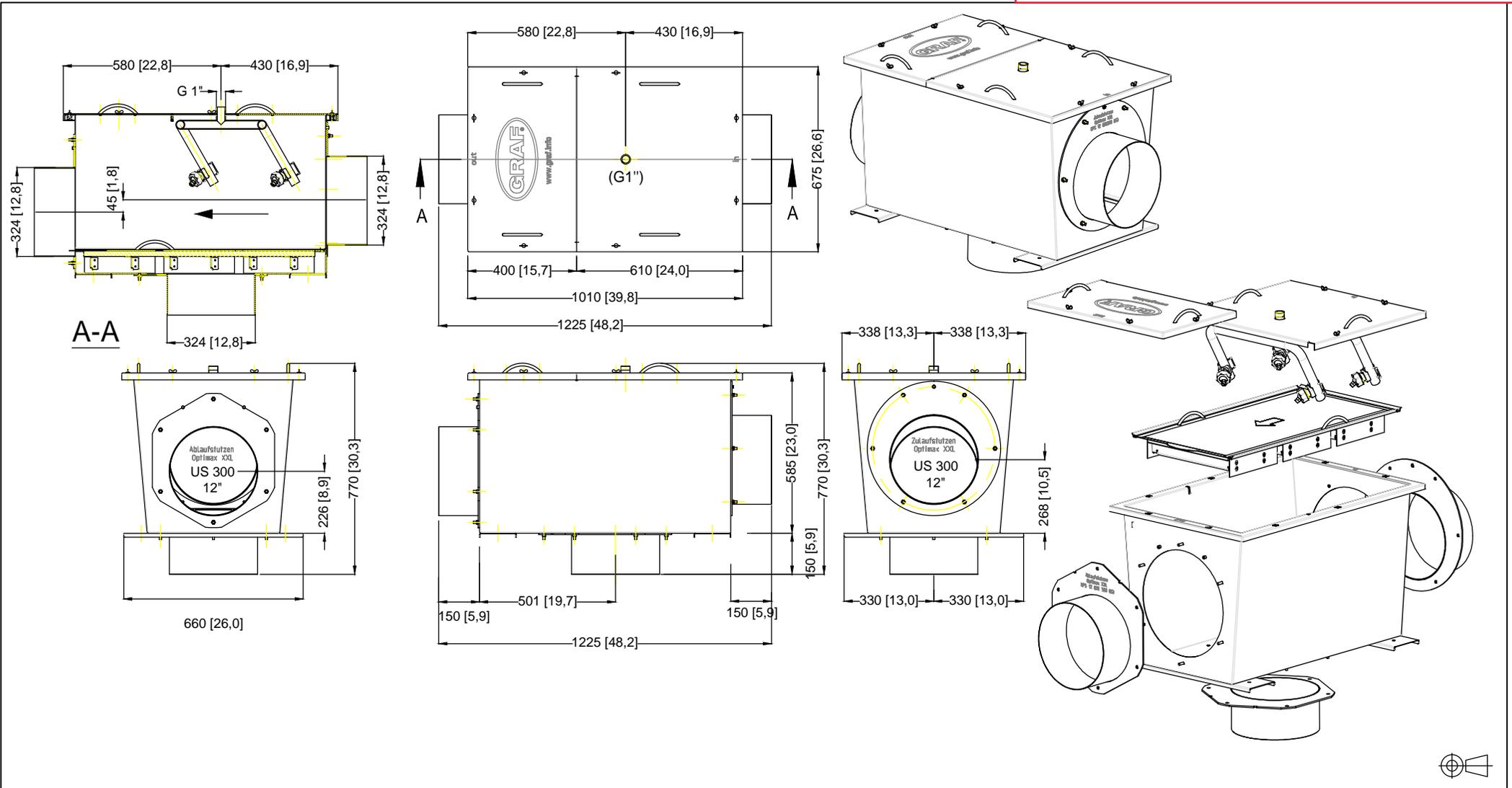


Technical data

Description	Connection DN 250/10"	Connection DN 300/12"	Connection DN 400/16"
Max. roof area	2,000 m ² 21,600 ft ²	3,000 m ² 32,300 ft ²	6,000 m ² 65,000 ft ²
Max. flow	50 l/sec 13 US gal./sec*	100 l/sec 27 US gal./sec*	200 l/sec 53 US gal./sec*
Water yield	over 95 %	over 95 %	over 95 %
Flow sprayer	80 l/min 21 US gal./min.	80 l/min 21 US gal./min.	80 l/min 21 US gal./min.
Length	1225 mm 44,3"	1225 mm 44,3"	1225 mm 44,3"
Width	675 mm 26,5"	675 mm 26,5"	675 mm 26,5"
Height	770 mm 30,7"	770 mm 30,7"	770 mm 30,7"
Height offset inlet and outlet	45 mm 1,7"	45 mm 1,7"	45 mm 1,7"
① Connection inlet	DN 250 10"	DN 300 12"	DN 400 16"
② Connection to sewer	DN 250 10"	DN 300 12"	DN 400 16"
③ Connection filtered water	DN 250 10"	DN 300 12"	DN 400 16"
④ Connection cleaning unit	1" (min. 2,5 bar)	1" (min. 2,5 bar)	1" (min. 2,5 bar)

* Dimensioning according to DIN 1986 for horizontal pipelines for a max. partial pipe filling of 0,7 at 1,5 % slope

This unit must be installed in a vault with access doors for in-ground installations. Minimum vault ID should be 6'L x 4'W x 4'H. Vault supplied by others.



D				GRAF Optimax-XXL Filter, extern US 300 ohne Schacht für bauseitigen Einbau		Artikel-Nr. product no. 340096 / 340098 article no. artículo no.	
GB		ES		FR		Otto Graf GmbH Carl-Zeiss-Str. 2-6 DE-79331 Teningen mail@graf.info www.graf.info	
GRAF Optimax-XXL Filter, external US 300 / without shaft		GRAF Optimax-XXL Filtro, externo US 300 / sin arqueta		GRAF Optimax-XXL Filtre, externe US 300 / sans un regard			
gezeichnet, drawn ISC		Gewicht, weight 91,5 kg		revision			
Datum, date 2015.11.25		Toleranz, tolerance +/- 3%		Maßstab, scale M 1:20		Einheiten, units mm [inch] gal. = US gal.	



Subject of test : **Testing the filtering capacity of a rainwater filter**

Client : **Otto Graf GmbH
Kunststofferzeugnisse
Herr Dirk Mundt
Carl-Zeiss-Straße 2-6
79331 Teningen**

Tested by: **Fa. Axel Zangenberg GmbH & Co. KG
vertreten durch:
C. Pannach**

Subject :
Optimax XXL – connexion 300/12" (USA)

Reference :
AZ-Prüfstand S6/500

Manufacturer: **Otto Graf GmbH, Teningen**

Manufacturer: **Axel Zangenberg GmbH & Co. KG**

Test setup: The water volume is regulated with a valve and a calibrated MFM (magnetic flow meter) before the filter inlet (inflow). The volume of unfiltered water is measured with the help of another calibrated MFM at a filter outlet (overflow). The difference is the volume of filtered water (cleanwater outlet). This is being determined by calculation. The measuring error of the used MFMs is less than 1%.

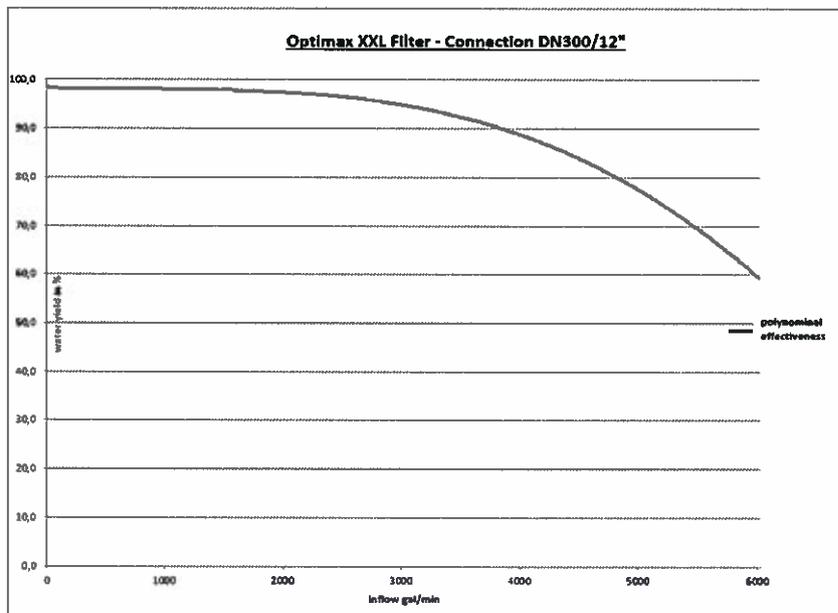
Sensor: **DN 500 E+H Typ Promag 53**

Serialnumber: **81 14A8 19000**

Accuracy : **Measurementerror <1% from reading**

**Result
Process:**

test date / time	overflow average	cleanwater outle average	inflow average	water yield average
	gal/min	gal/min	gal/min	
28.07.2015 14:36	18	480	492	97,6
28.07.2015 14:38	18	1548	1566	98,9
28.07.2015 14:40	18	1518	1536	98,8
28.07.2015 14:42	174	2814	2988	94,2
28.07.2015 14:44	168	2718	2886	94,2
28.07.2015 14:46	780	3888	4668	83,3
28.07.2015 14:48	2478	3546	6024	58,9

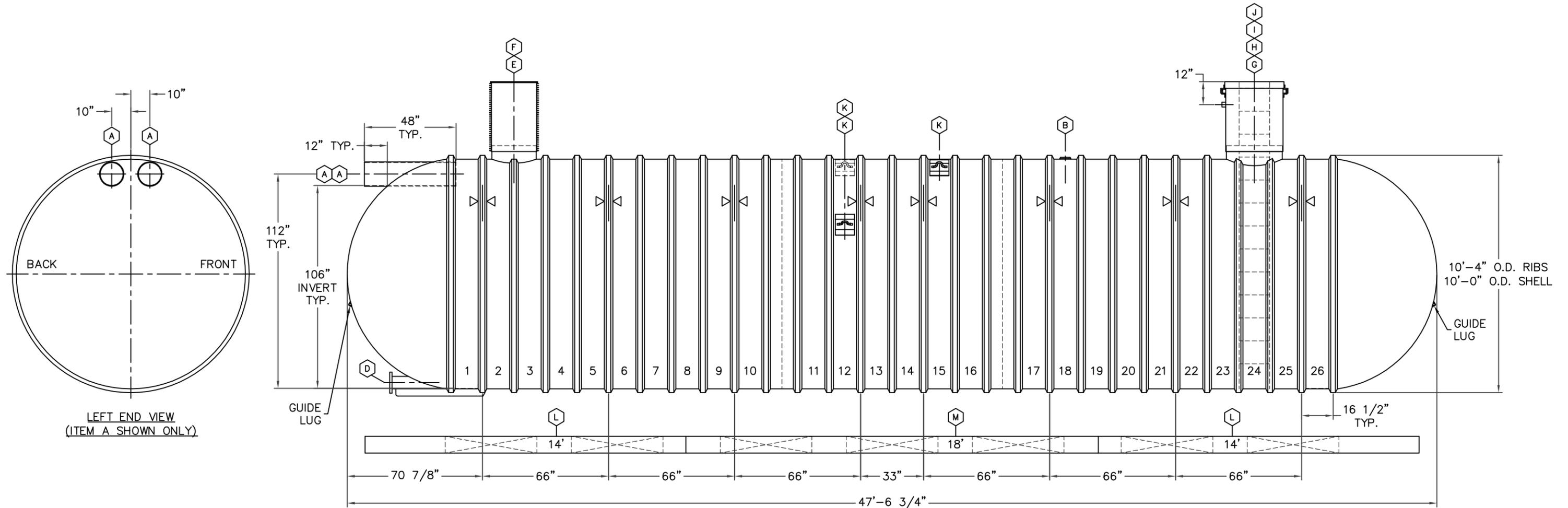


28.07.2015
C. Pannach

STORAGE TANK

NOTES:

1. INVERT DIMENSION FROM TANK I.D.
2. NOMINAL TANK WEIGHT : 11,100 lbs



ITEM	QTY	DESCRIPTION
(A)	2	12"DIA SCH 40 PVC HORIZONTAL PIPE
(B)	1	4"NPT SERVICE FITTING
(C)	-	THIS ITEM DELETED
(D)	1	6"DIA FLANGED & GUSSETED TANGENTIAL NOZZLE WITH BOTTOM SUPPORT
(E)	1	RISER PIPE, 23 3/8" O.D., FOR 24"(NOMINAL) ACCESS OPENING
(F)	1	24"DIA x 36"HIGH PVC RISER WITH FRP LID
(G)	1	RISER PIPE, 29 3/8" O.D., FOR 30"(NOMINAL) ACCESS OPENING

(H)	1	30"DIA x 36"HIGH SLIP-ON FRP RISER WITH FRP LID & 2"FRP NPT FITTING
(I)	1	FRP LADDER (16" WIDE, TANK MOUNTED) FOR 10' DIA TANK
(J)	1	36"HIGH FIBERGLASS LADDER (16" WIDE, EXTENSION MOUNTED)
(K)	3	LIFTING LUG (12"x10") 22.5", 22.5", 45"
(L)	4	14' PREFABRICATED CONCRETE DEADMEN
(M)	2	18' PREFABRICATED CONCRETE DEADMEN
(△△)	8	HOLD DOWN STRAP LOCATION

CUSTOMER DESIGNATION:

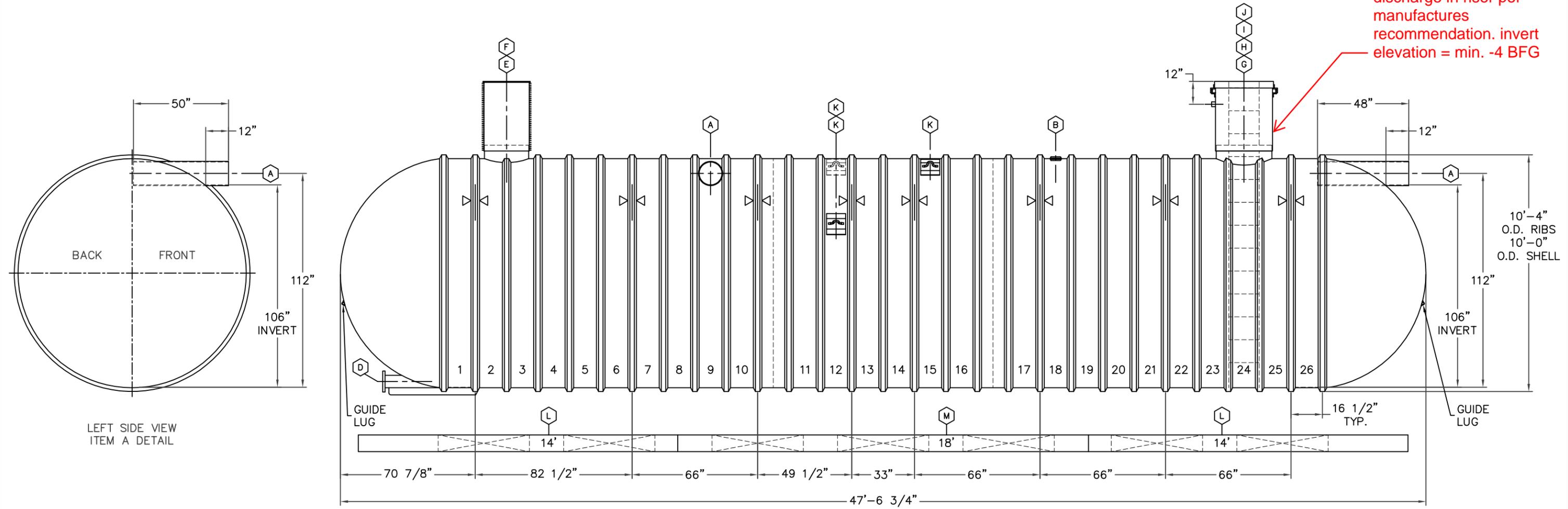
TANK #1

04	REMOVED 6" PIPE (ITEM C). REVISED QTY OF ITEM A.					
DRN	DD	DATE	CHK'D	DATE	APPR'D	DATE
		2-12-19	DAG	2-12-19	-	-
03	RELOCATED ITEM C & D, UPDATED LIFT LUGS					
DRN	LB	DATE	CHK'D	DATE	APPR'D	DATE
		1-30-19	DAG	1-30-19	-	-
02	ADDED LADDER TO RISER.					
DRN	DD	DATE	CHK'D	DATE	APPR'D	DATE
		8-24-18	-	-	-	-
01	REVISED ITEM H. ADDED LADDER. RELABELED ITEMS.					
DRN	DD	DATE	CHK'D	DATE	APPR'D	DATE
		8-24-18	-	-	-	-
XERXES a zcl company						
DRN	DATE	TITLE	DR. SIZE	DR. NUMBER	REV	
DAG	8-21-18	10' DIA SW CAP. 25,000 GALLONS SOMERVILLE	D	658-666	04	
SALES MANAGER	TODD MITCHELL	SCALE: 1/2"=1'-0"				SWT 1 OF 1
INDUSTRY TYPE: M204 WATER COLLECTION AND CONSERVATION						

- NOTES:
 1. INVERT DIMENSION FROM TANK I.D.
 2. NOMINAL TANK WEIGHT : 11,100 lbs

Tank #2 Revised - 4/3/19

add grommet for pump discharge in riser per manufactures recommendation. invert elevation = min. -4 BFG



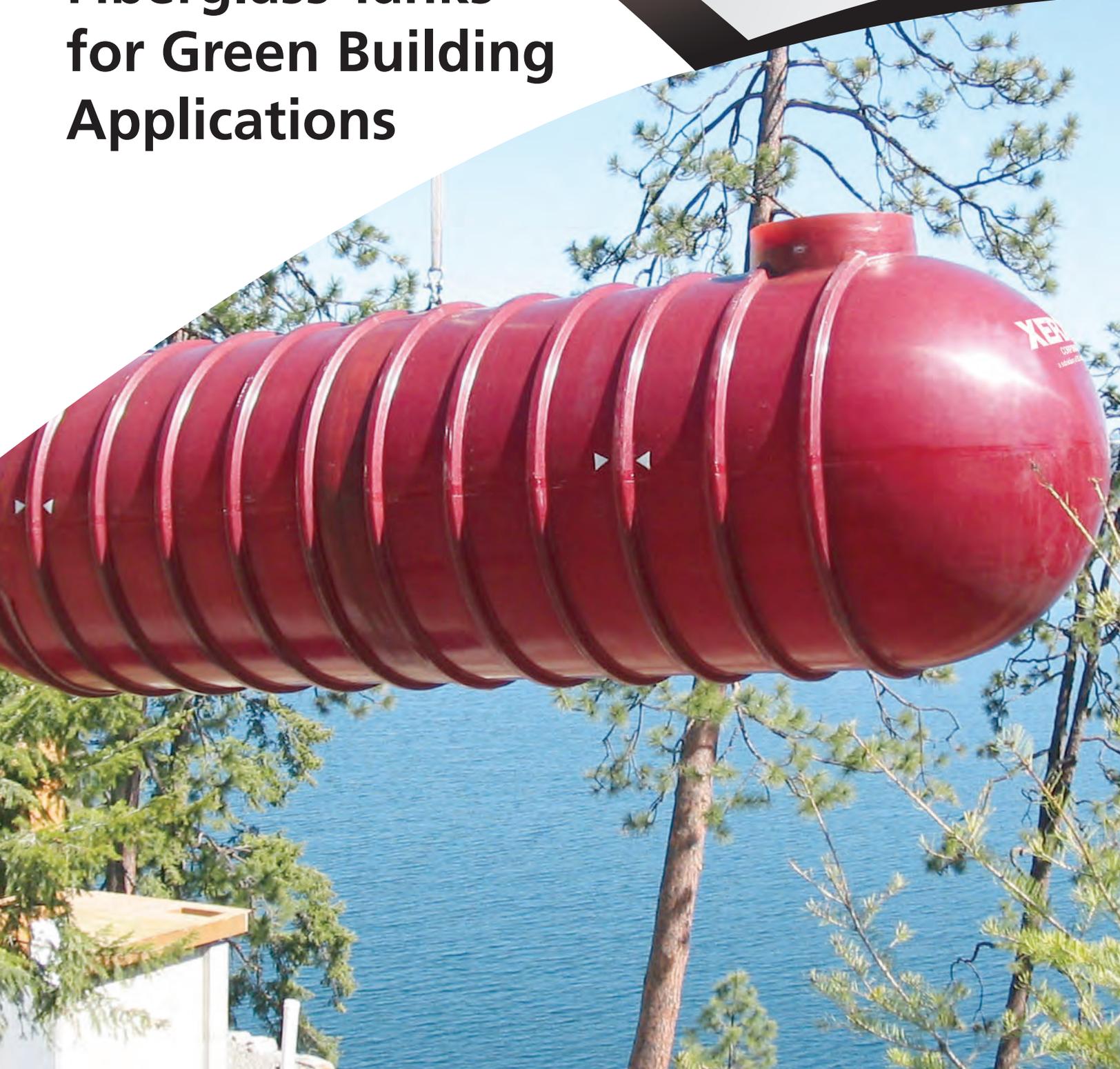
ITEM	QTY	DESCRIPTION
(A)	2	12"DIA SCH 40 PVC HORIZONTAL PIPE
(B)	1	4"NPT FULL COUPLING SERVICE FITTING
(C)	-	THIS ITEM DELETED
(D)	1	6"DIA FLANGED & GUSSETED TANGENTIAL NOZZLE WITH BOTTOM SUPPORT
(E)	1	RISER PIPE, 23 3/8" O.D., FOR 24"(NOMINAL) ACCESS OPENING
(F)	1	24"DIA x 36"HIGH PVC RISER WITH FRP LID
(G)	1	RISER PIPE, 29 3/8" O.D., FOR 30"(NOMINAL) ACCESS OPENING

(H)	1	30"DIA x 36"HIGH SLIP-ON FRP RISER WITH FRP LID & 2"FRP NPT FITTING
(I)	1	FRP LADDER (16" WIDE, TANK MOUNTED) FOR 10' DIA TANK
(J)	1	36"HIGH FIBERGLASS LADDER (16" WIDE, EXTENSION MOUNTED)
(K)	3	LIFTING LUG (12" x 10") 22.5" 22.5" 45"
(L)	4	14' PREFABRICATED CONCRETE DEADMEN
(M)	2	18' PREFABRICATED CONCRETE DEADMEN
(D)	8	HOLD DOWN STRAP LOCATION

CUSTOMER DESIGNATION:
TANK #2

04	RELOCATED ITEM A ONTO FLAT #9 FACING FRONT.				
DRN	DATE	CHK'D	DATE	APPR'D	DATE
DD	4-3-19	DAG	4-3-19	-	-
03	ADDED 6" NOZZLE (ITEM D).				
DRN	DATE	CHK'D	DATE	APPR'D	DATE
DD	2-12-19	DAG	2-12-19	-	-
02	REMOVED 6" NOZZLE (ITEM D).				
DRN	DATE	CHK'D	DATE	APPR'D	DATE
DD	2-12-19	DAG	2-12-19	-	-
01	REMOVED 6" PIPE (ITEM C). REVISED QTY OF ITEM A. REVISED ITEM B.				
DRN	DATE	CHK'D	DATE	APPR'D	DATE
DD	2-12-19	DAG	2-12-19	-	-
XERXES® a zcl company					
DRN	DATE	TITLE	REV		
LB	1-30-19	10' DIA SW			
CHK'D	DATE	CAP. 25,000 GALLONS			
DAG	1-30-19	SOMERVILLE			
APPR'D	DATE	DR. SIZE	DR. NUMBER	REV	
		D	660-044	04	
SALES MANAGER	TODD MITCHELL		SCALE: 1/2"=1'-0"	SHT 1 OF 1	
INDUSTRY TYPE: M204 WATER COLLECTION AND CONSERVATION					

Fiberglass Tanks for Green Building Applications



Xerxes Fiberglass Tanks for Green Building



When people think of green building, they often think of the more obvious elements they see in design, such as energy conservation and environmentally friendly materials. Project owners and designers sometimes miss less obvious components that are just as important, such as stormwater management, water efficient landscaping, innovative wastewater technologies and water use reduction. These are the areas in which owners and designers of new construction and major renovation projects can use Xerxes fiberglass products and qualify for points under the U.S. Green Building Council's sustainable sites and water efficiency categories of its Leadership in Energy and Environmental Design (LEED®)⁽¹⁾ Green Building Rating System™.⁽²⁾

Meeting the requirements of green building is a natural extension of what Xerxes has always done. Long before green building was formalized as a national system, Xerxes' rustproof, watertight fiberglass tanks provided safe storage of liquids while protecting the environment. Since its inception, Xerxes has been an innovator, designing and manufacturing high-quality, cost-effective fiberglass tanks that provide reliable, long-term solutions for underground storage of liquids. Xerxes is well-known as a major

tank supplier to the petroleum industry, with many of the world's largest oil companies using Xerxes tanks for environmentally safe retail gasoline storage. Xerxes has applied that same expertise to the water and wastewater industry, and has become widely accepted as a superior option for the underground storage or processing of liquids in a wide range of applications. In other words, green building project owners and designers can take advantage of what Xerxes already offers.

Storage tanks aren't the only Xerxes products that can be incorporated into designs that might qualify for LEED credits. For instance, wet wells and lift stations can also be key elements in green building projects. The following pages present just a few examples of how Xerxes tanks, in already-proven applications, can be a key element in design concepts that qualify for available LEED credits in new construction and major renovation projects.

1) LEED® is a registered trademark of the U.S. Green Building Council, a nonprofit corporation independent of Xerxes Corporation.

2) LEED® Green Building Rating System™ is a trademark of the U.S. Green Building Council, a nonprofit corporation independent of Xerxes Corporation.

WE Prerequisite 1: Water Use Reduction

Intent: Increase water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.

Requirements: Employ strategies that in aggregate use 20% less water than the water use baseline calculated for the building (not including irrigation). Calculations are based on estimated occupant usage and must include only the following fixtures and fixture fittings (as applicable to the project scope) : water closets, urinals, lavatory faucets, showers, kitchen sink faucets and pre-rinse spray valves.

Source: U.S. Green Building Council, April 2009

Water Efficiency Category: LEED Credits for Water Efficiency Landscaping

Xerxes water tanks can easily fit into a design that qualifies for water efficiency landscaping credits under the LEED Water Efficiency category (Credit 1.1 and Credit 1.2). The intent of these LEED credits is to limit or eliminate the use of potable water, or other natural water resources, for landscape irrigation. Xerxes tanks are routinely used to collect and store captured rainwater or recycled site water, which is then used for landscape irrigation. Using rainwater and/or greywater instead of potable water is one way to reduce the use of potable water for irrigation. Using Xerxes water tanks, a system can be designed to conserve as much as 100 percent of potable water for such purposes. The use of rainwater “cisterns”, incorporated into building designs, is a practice that has been used for decades. Now, with LEED credits available, architects and building designers are routinely incorporating a state-of-the-art fiberglass cistern, providing the confidence that the collected water supply will be there as needed and not lost through cracks and leaks from less reliable storage products.



LEED Credits for Water Efficiency (WE)

WE Credit 1.1: Water Efficient Landscaping (Reduce by 50%)

WE Credit 1.2: Water Efficient Landscaping (No Potable Water Use or No Irrigation)

Intent: Limit or eliminate (50%) or eliminate (100%) the use of potable water, or other natural surface or subsurface water resources available on or near the project site, for landscape irrigation.

Requirements for Credit 1.1: Reduce potable water consumption for irrigation by 50% from a calculated mid-summer baseline case. Reductions must be attributed to any combination of the following items: plant species density and microclimate factor, irrigation efficiency, use of captured rainwater, use of recycled wastewater, use of water treated and conveyed by a public agency specifically for nonpotable uses.

Requirements for Credit 1.2: Achieve WE Credit 1.1 AND use only captured rainwater, recycled wastewater, recycled greywater, or water treated and conveyed by a public agency specifically for nonpotable uses for irrigation OR install landscaping that does not require permanent irrigation systems.

Source: U.S. Green Building Council, April, 2009

Water Efficiency Category: LEED Credit for Innovative Wastewater Technologies

Xerxes wastewater tanks are a natural component of systems designed to qualify for the innovative wastewater technology credit available under the LEED Water Efficiency category (Credit 2). This credit requires reducing the use of municipally provided potable water for building sewage conveyance by a minimum of 50 percent or the treatment of wastewater on site to tertiary standards. Onsite wastewater technology is an increasingly recognized commercial design concept for which Xerxes tanks have long been a critical component. The need to address wastewater management has led to the growing acceptance of onsite treatment. Xerxes wastewater tanks are used as process tanks, dosing tanks, recirculation tanks, collection tanks and holding tanks, all part of a complete wastewater treatment system in such projects as schools, commercial buildings, office complexes and housing developments. As wastewater treatment system designers develop new technologies, Xerxes tanks continue to be a part of that evolution.



LEED Credits for Water Efficiency (WE)

WE Credit 2: Innovative Wastewater Technologies

Intent: Reduce wastewater generation and potable water demand, while increasing the local aquifer recharge.

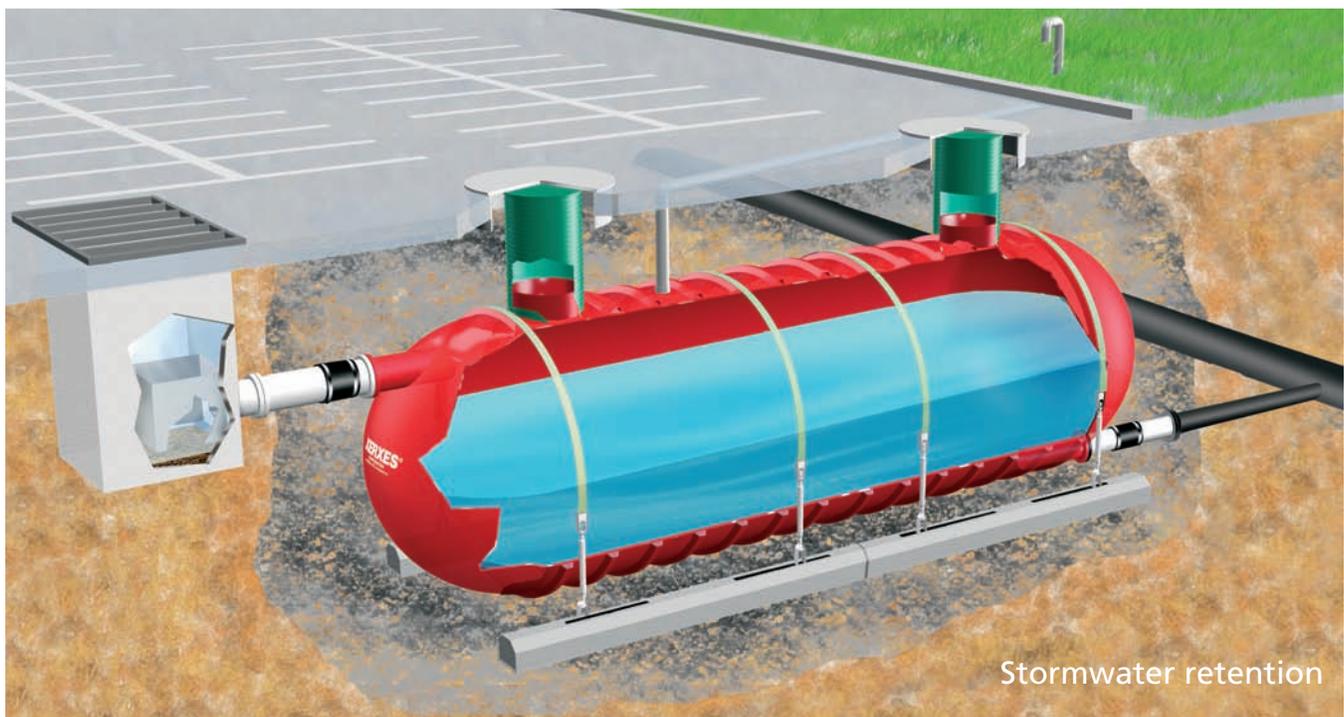
Requirements: Option 1/Reduce potable water use for building sewage conveyance by 50% through the use of water-conserving fixtures (water closets, urinals) or nonpotable water (captured rainwater, recycled greywater, and onsite or municipally treated wastewater).
OR

Option 2/Treat 50% of wastewater onsite to tertiary standards. Treated water must be infiltrated or used onsite.

Source: U.S. Green Building Council, April, 2009

Sustainable Sites Category: LEED Credits for Stormwater Design

Environmental concerns have changed the management of stormwater runoff. When stormwater runs directly into sewer systems, it can result in either groundwater contamination or overloading of stormwater infrastructure. To address these problems, many communities now require a specific retention time before allowing stormwater to run into the drainage system. Typically, retention ponds are used to meet this requirement. As part of a stormwater management system, Xerxes underground water tanks offer a better alternative, which may also qualify for the stormwater design credits available under the LEED Sustainable Sites category (Credits 6.1 and 6.2). While meeting retention-in-time requirements, developers and property owners can also make better use of property by locating stormwater tanks in parking lots or parking areas. This is a significant benefit with the rising cost of land. (Xerxes tanks are rated for H-20 loads.) In addition, the collected stormwater can be used for non-potable uses such as landscape irrigation.



LEED Category: Sustainable Sites (SS)

SS Credit 6.1 Stormwater Design: Quantity Control

Intent: Limit disruption of natural water hydrology by reducing impervious cover, increasing onsite infiltration, reducing or eliminating pollution from stormwater runoff, and eliminating contaminants.

Requirements: See LEED 2009 for New Construction and Major Renovations Version 3.0, page 14.

SS Credit 6.2 Stormwater Design: Quality Control

Intent: Limit disruption and pollution of natural water flows by managing stormwater runoff.

Requirements: See LEED 2009 for New Construction and Major Renovations Version 3.0, page 15.

Source: U.S. Green Building Council, April 2009

Water Efficiency Category: LEED Credits for Water Use Reduction

Xerxes water tanks can be a component of many designs that would qualify for Water Use Reduction credits (3.1 and 3.2) under the LEED Water Efficiency category. Both of these credits have the same intent: to reduce the burden on municipal water supply and wastewater systems by maximizing water efficiency within buildings. Whether the aim is a 20 percent or a 30 percent reduction of water use, Xerxes water tanks can be used to collect plumbing greywater that can then be used for nonpotable applications, such as toilet and urinal flushing, mechanical systems and custodial uses. Xerxes tanks have been used for such applications in mixed-use commercial complexes throughout the United States. These applications can serve as templates for many others.



LEED Credits for Water Efficiency (WE)

WE Credit 3.1: Water Use Reduction (20% Reduction)

WE Credit 3.2: Water Use Reduction (30% Reduction)

Intent: Further increase water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.

Requirements: Employ strategies that in aggregate use less water than the water use baseline calculated for the building (not including irrigation) after meeting the Energy Policy Act of 1992 fixture performance requirements. Calculations are based on estimated occupant usage and must include only the following fixtures (as applicable to the building): water closets, urinals, lavatory faucets, showers, kitchen sinks and prespray valves.

Source: U.S. Green Building Council, April, 2009

Xerxes Tank Applications & Green Building: The List Goes On



Existing Buildings Rating System: An additional LEED Point

In addition to the numerous opportunities outlined in this brochure to establish points using the LEED for New Construction Rating System, USGBC's standard for the upgrade of existing facilities; LEED for Existing Buildings: Operations and Maintenance, also provides a separate and unique opportunity. Credit 4.2 of the Water Efficiency (WE) category addresses Cooling Tower Water Management, and provides a point for the use of makeup water that consists of at least 50 percent non-potable water. Incorporating Xerxes tanks into the design of an existing building is an excellent way to capture the additional point specific to this separate rating criteria.

The List Goes On

Aside from the design concepts shown in this brochure that may qualify for Green Building LEED credits, Xerxes tanks have a wide variety of applications. Xerxes tanks can be used in office developments, schools, healthcare facilities, mixed-use commercial developments, sanitary stations, resorts and casinos, to name just a few. There are a variety of ways that Xerxes tanks are used in innovative ways that don't qualify for LEED credits but have important design uses nonetheless.

For instance, Xerxes manufactures potable water tanks with an NSF® (National Sanitation Foundation) listing. Xerxes tanks are also widely used for fire-protection systems designed to comply with ever-changing fire codes. In addition, Xerxes tanks are used as residential cisterns and in car wash water-reclaim units, campgrounds, rest areas and truck stops. Again, whatever a customer's water tank needs, a Xerxes tank can be designed and manufactured to meet that particular application.

For more product information and for information on how to contact a Xerxes sales representative near you, please visit the Xerxes Web site at www.xerxes.com.

Features of Xerxes Tanks

- Constructed of rustproof, long-lasting fiberglass
- Manufactured to meet customers' functional requirements
- Designed with integral ribs for added strength
- Designed for H-20 load conditions
- Easy to ship and install
- Available from four U.S. manufacturing locations
- Manufactured to applicable requirements of Underwriters Laboratories and American Water Works Association standards
- Available in NSF-listed models
- Available in single-wall, double-wall and triple-wall models
- Available in sizes from 600 gallons to sizes in excess of 60,000 gallons

National benchmark for green building



The U.S. Green Building Council promotes the design and construction of buildings that are environmentally responsible, profitable and healthy places to live and work. This organization developed and administers the LEED Green Building Rating System that is the nationally accepted benchmark for the design, construction and operation of high-performance green buildings. LEED recognizes performance in six key areas of new construction and major renovations: sustainable sites, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, and innovation and design process. The LEED credit system is an easy way to identify projects and project components that meet this nationally accepted standard. As shown on the following pages, Xerxes tanks can be part of a variety of applications that may qualify for LEED credits.

Source: U.S. Green Building Council, November, 2007

This brochure was printed on 100 percent recycled paper that is FSC and Green-e certified. The paper was processed chlorine free. This brochure was printed using soy-based inks.





Xerxes Manufacturing Facilities

ZCL Manufacturing Facilities

Anaheim, CA

Phone 714.630.0012
 Fax 714.632.7133

Hagerstown, MD

Phone 301.223.6933
 Fax 301.223.6836

Edmonton, AB

Phone 800.661.8265
 Fax 780.466.6126

Drummondville, QC

Phone 800.661.8265
 Fax 780.466.6126

Seguin, TX

Phone 830.372.0090
 Fax 830.372.0321

Tipton, IA

Phone 563.886.6172
 Fax 563.886.2042

Waverley, NS

Phone 800.661.8265
 Fax 780.466.6126



Hagerstown, MD

XERXES®

CORPORATION

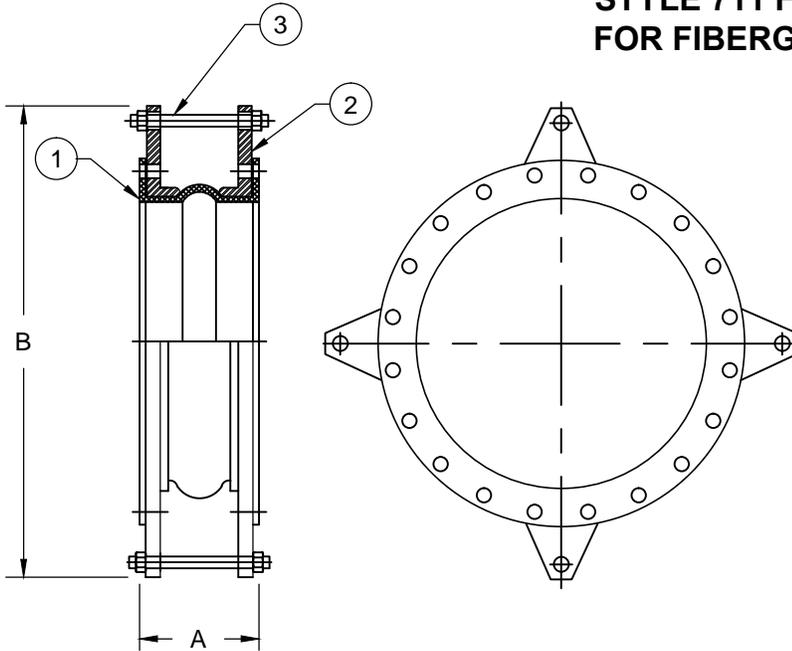
a subsidiary of ZCL Composites Inc.

7901 Xerxes Avenue South
 | Minneapolis | MN | 55431-1288
 Ph: 952.887.1890 Fax: 952.887.1882



www.xerxes.com

STYLE 711 FRP WIDE ARCH EXPANSION JOINT FOR FIBERGLASS AND PLASTIC PIPE



NOTE:
THIS FLEXIBLE JOINT SHOULD BE INSTALLED THE LENGTH SHOWN ON DRAWING. PIPING AND EQUIPMENT CONNECTED BY THIS FLEXIBLE JOINT SHOULD BE ANCHORED AND GUIDED. NOT INTENDED FOR TORSION.

ITEM	NAME	MATERIAL
1	BODY	EPDM
2	RETAINING RING	DUCTILE IRON
3	CONTROL ROD GALVANIZED	C/S

MAXIMUM WORKING TEMPERATURE: 230°

PIPE SIZE	NO. OF CONTROL RODS
2" - 5"	3
6" - 10"	4
12" - 24"	6

QTY.	SIZE (NPS)	A F/F (IN.)	B (IN.)	PRESSURE (PSIG)	VACUUM (IN. HG.)	MOVEMENT CAPABILITY AND FORCES @ 0 PSI *						EFFECTIVE AREA (SQ IN.)	WEIGHT (LB)	
						COMPRESSION		ELONGATION		LATERAL				ANGULAR
						MAX DEFL (IN.)	SPRING RATE (LB/IN.)	MAX DEFL (IN.)	SPRING RATE (LB/IN.)	MAX DEFL (IN.)	SPRING RATE (LB/IN.)			MAX DEFL (DEG.)
	2"	6	8-1/2"	150	10	1-3/4	126	3/4	160	3/4	213		14	7
	2-1/2"	6	9-3/8"	150	10	1-3/4	160	3/4	200	3/4	227		17	9
	3"	6	10"	150	10	1-3/4	189	3/4	240	3/4	253		21	10
	4"	6	11-1/8"	150	10	1-3/4	257	3/4	333	3/4	280		36	11
	5"	6	13"	150	10	1-3/4	311	3/4	413	3/4	333		50	14
	6"	6	14"	150	10	1-3/4	383	3/4	493	1	370		66	18
	8"	6	16-1/2"	150	10	1-3/4	423	3/4	547	1	450	**	101	25
	10"	8	19"	150	10	1-3/4	531	3/4	693	1	480		145	36
	12"	8	22"	150	10	1-3/4	554	3/4	733	1	570		199	48
	14"	8	28"	150	10	2	595	7/8	766	1-1/8	667		260	60
	16"	8	32"	150	10	2	635	7/8	823	1-1/8	773		329	68
	18"	8	33"	150	10	2	715	7/8	926	1-1/8	853		403	77
	20"	8	36"	150	10	2	795	7/8	1029	1-1/8	951		482	77
	24"	10	40"	150	10	2	1070	7/8	1417	1-1/8	1022		695	120

***CALCULATING ANCHOR/THRUST LOADS:**

MULTIPLY THE GREATER OF THE MAXIMUM SYSTEM TEST PRESSURE OR OPERATING PRESSURE TIMES THE EFFECTIVE AREA TO OBTAIN THE FORCE THAT WILL BE EXERTED BY THE PRESSURIZED EXPANSION JOINT ON THE ADJACENT PIPING. ANCHORS MUST BE STRONGER THAN THIS FORCE IF THE JOINT IS TO COMPRESS AND COMPENSATE FOR THE PIPE'S THERMAL EXPANSION. PIPE GUIDES WILL BE NECESSARY TO DIRECT MOVEMENT OF THE PIPE'S EXPANSION.

****DUE TO UNEVEN LOADING OF TIE RODS FACTORY MUST BE CONSULTED.**

CUSTOMER: _____
PROJECT: _____
ENGINEER: _____

REV.	24" F/F UPDATED DATE 04/12/2012	
		2323 W. HUBBARD ST. CHICAGO, IL 60612 TEL: 312-738-3800 FAX: 312-738-0415 WWW.METRAFLEX.COM
DESCRIPTION: STYLE 711 FRP WIDE ARCH EXPANSION JOINT		
DRAWN BY:	MIR	DATE: 04/12/2012
APPROVED:	MIR	DATE: 04/12/2012
SCALE:	DRAWING NUMBER: 711 FRP	
NONE		



Liquid Storage Solutions for
Your Most Precious Resources



Above ground Stainless Steel Tank



CONTAIN

WATER SYSTEMS INC

The Classic Metal Cistern



Spec Sheet and Price List - January 2017

Tanks are constructed of 304 stainless steel.

This is FDA approved for potable water and meets ANSI/NSF 61 specifications. Stainless tanks have no liner. Galvanized are warranted for one year, stainless five years.

Tanks should be installed on a solid base. Concrete pads or crushed granite are well suited.

Capacity (gallons)	Size (WxH)	Est. Weight (lbs.)
3750	8' X 10'	790

Add 12" to height for the top.

Delivery and shipping is available. All tanks are built to order with a 3-4 week lead time. Prices subject to change.



LiquiLevel

LIQUID LEVEL INDICATOR FOR STORAGE TANKS

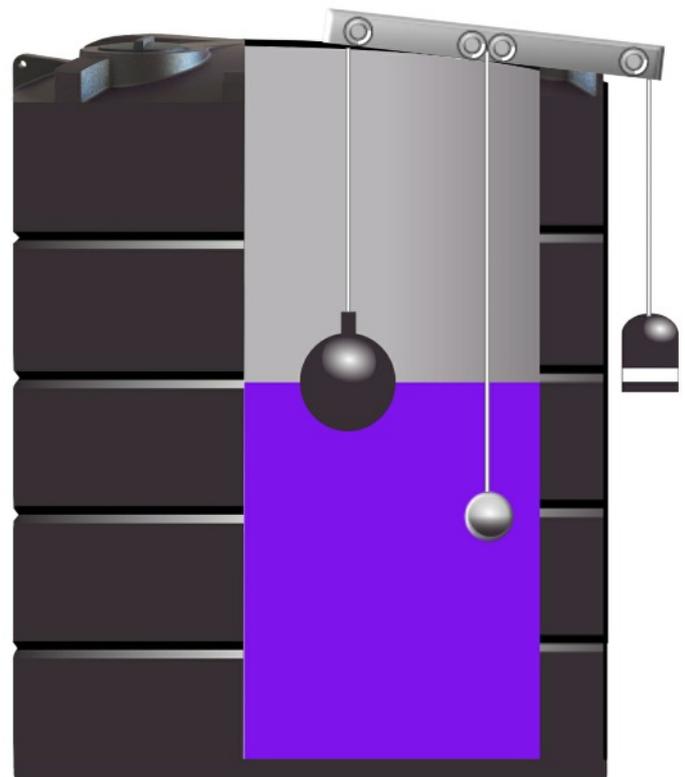
The LiquiLevel Level indicator is a innovative float operated system which indicates the true liquid level within storage tanks, unlike other gauges which read 'back to front'. What you see, is what you have. The LiquiLevel is designed to suit almost any type and shape of storage tank, and is ideal for a wide variety of applications.

Benefits

Recommended for virtually any liquid storage tank
Suitable for all liquid storage tanks upto 5 mtrs tall
Simple and quick installation
No need to enter tank for installation
Shows true liquid level
Low maintenance

Principle of operation

Operation of the LiquiLevel is by means of a float ball which moves up and down on top of the liquid inside the tank. The float is connected by a Polyester cord which runs through a simple pulley and counterweight system. The chemical resistant counterweight inside the tank ensures the Level indicator always stays the same level as the liquid stored within the tank, thus showing the true liquid level.



Installation

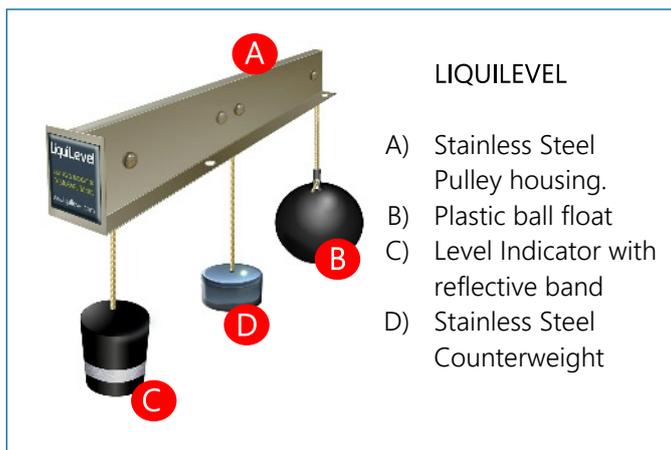
The LiquiLevel is supplied complete with fixing kit and installation template. The LiquiLevel should be installed as near to the tank access cover as possible for ease of installation and maintenance purposes.

Materials of construction

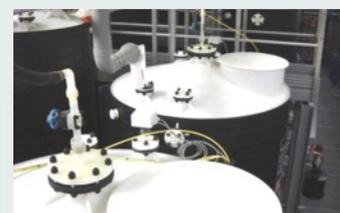
Standard materials of construction are shown over-leaf. Other material options are available for specific applications when required.

Optional Extras

Longer cord for tanks upto 10 metres in height.
Guide wire system.

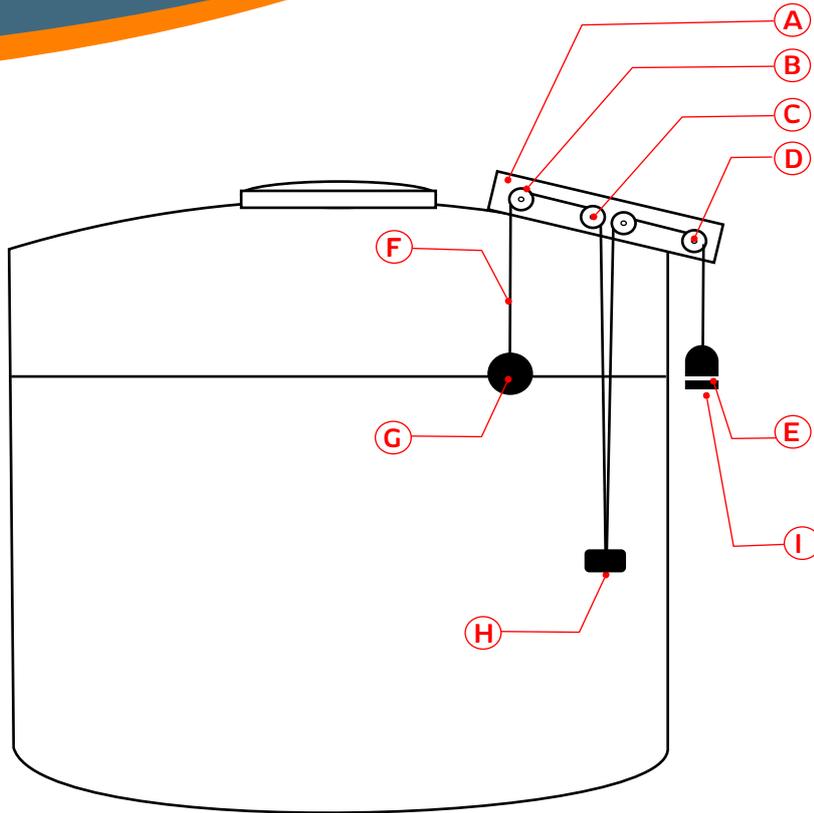


STOCK NO:	DESCRIPTION	TANK HEIGHT
10005	5 Mtr LiquiLevel Tank Level Indicator	Upto 5 mtr
10010	10 mtr LiquiLevel Tank Level Indicator	Upto 10 mtr

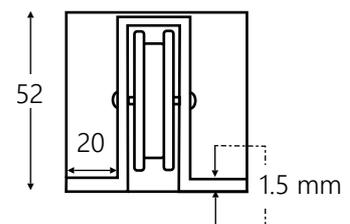
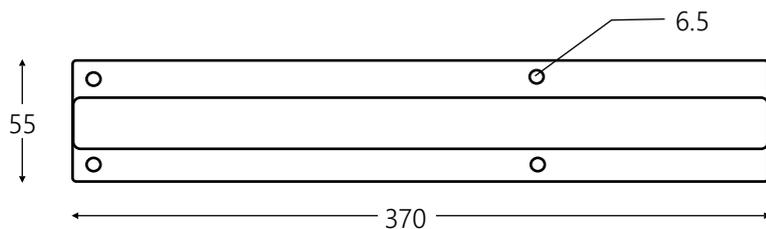


LiquiLevel

SPECIFICATION



Item	Description	Std Material	Option
A	Pulley Housing	Stainless Steel 316	
B	Pulley	Nylon	
C	Pulley Shaft	Stainless steel EN10088	
D	Pulley shaft retaining clip	Stainless steel EN10088	
E	Level Indicator	UV Resistant PVC	
F	Pulley cord	Polyester	Stainless Steel
G	Float Ball	Polypropylene	Stainless Steel
H	Counterweight	Stainless Steel 316	
I	Level Indicator Cap	PVC	



All measurements in (mm)



Product: Commercial Screened Rain Heads

150mm & 225mm

6"

8"



Product Description

Keeps your Rain Harvesting system free of mosquitoes, vermin and debris.

Rain Heads prevent leaves and debris from blocking downpipes and entering your rainwater tank.

Rain Heads are ideal for fitting to each downpipe as they protect the building and improve your tank's water quality.

Features and Benefits

- Single screen – vermin and vector proof (0.955mm stainless steel aperture)
- 150mm Flow Rate 17 litres/sec
- 225mm Flow Rate 17 litres/sec
- Improves tank water quality
- No maintenance required - self cleaning Cleanshield™ technology
- Available in Stainless Steel, ZINCALUME® or in any of the 20 standard COLORBOND® colours
- Custom made – made to order

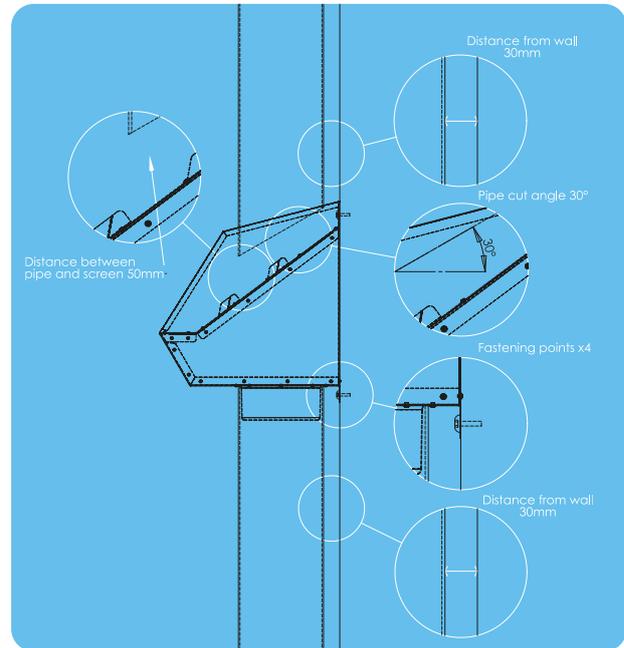
Compliance & Guidelines

- AS/NZS 3500 – Plumbing and Drainage
- QDC MP4.3
- enHealth Council
- ARID & Standards Australia
- QLD Health Regulation (Part 8 – Mosquito Prevention)

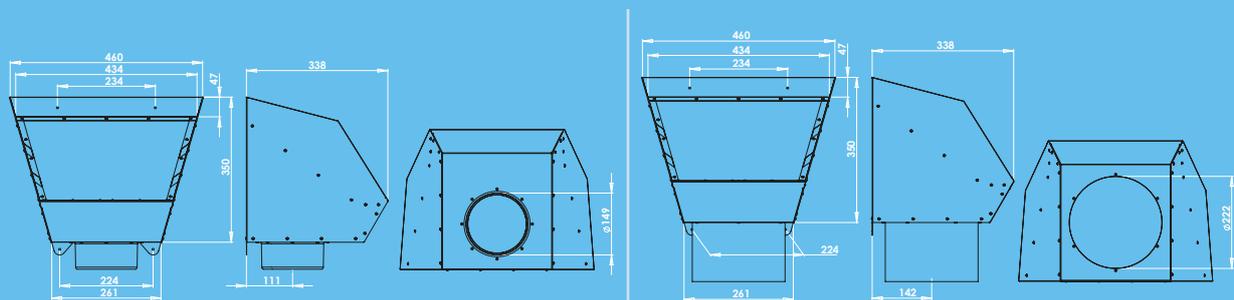
Installation

INSTALLATION INSTRUCTONS

1. Select a location for the Rain Head. A Rain Head installed at a height of 2.6 metres will prevent tampering while providing convenient access for maintenance.
2. Cut and bracket the bottom pipe to the wall. Offset the pipe 30mm from the wall.
3. Install the Rain Head into the pipe and mark the side flange fastening holes. Remove the Rain Head and prepare the necessary fastening points. Fasten the Rain Head to the wall ensuring that it is adequately supported by the wall structure.
4. Install pipe above the Rain Head with an offset of 30mm from the wall.
 - Cut the outlet of the pipe at an angle of 30 degrees to match the angle of the screen.
 - Position the angled pipe 50mm above the stainless steel screen.



150MM SCREENED RAIN HEAD		225MM SCREENED RAIN HEAD		
Dimensions	Width:	460mm	Width:	460mm
	Height:	350mm	Height:	350mm
	Depth:	338mm	Depth:	338mm
Body Material	ZINCALUME®/COLORBOND®/ Stainless Steel Sheet – 0.55mm		Body Material	ZINCALUME®/COLORBOND®/ Stainless Steel Sheet – 0.55mm
Weight	2.6kg		Weight	2.7kg
Colours	ZINCALUME®/COLORBOND® range or Stainless Steel (Grade 304)		Colours	ZINCALUME®/COLORBOND® range or Stainless Steel (Grade 304)
Mesh Gauge	0.955mm aperture 316 Stainless Steel		Mesh Gauge	0.955mm aperture 316 Stainless Steel



Maintenance

The Cleanshield™ screen of the Rain Head is mostly self-cleaning. However it is prudent to check periodically to ensure it is clear.

P0232

DISCLAIMER This product specification is not a complete guide to product usage. Further information is available from Rain Harvesting Pty Ltd and from the Installation and Operating Instructions. This specification sheet must be read in conjunction with the Installation and Operating Instructions and all applicable statutory requirements. Product specifications may change without notice. © Rain Harvesting Pty Ltd. COLORBOND® and ZINCALUME® are registered trademarks of BlueScope Steel Limited.

**RAINWATER
PUMPING
SYSTEM**

***WATERTRONICS PUMP STATION
EQUIPMENT SUBMITTAL***

Project Name: SOMERVILLE HIGH SCHOOL

RAINWATER CONTROL PANEL

Submittal Date: 2/11/19

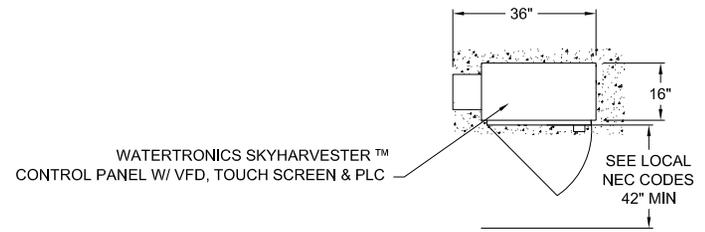
<input type="checkbox"/> APPROVED AS SUBMITTED
<input type="checkbox"/> APPROVED AS NOTED
<input type="checkbox"/> REVISE AND RESUBMIT
REVIEWED BY: _____
NAME: _____ DATE: _____

COMPONENTS POWERED BY PANEL INFO

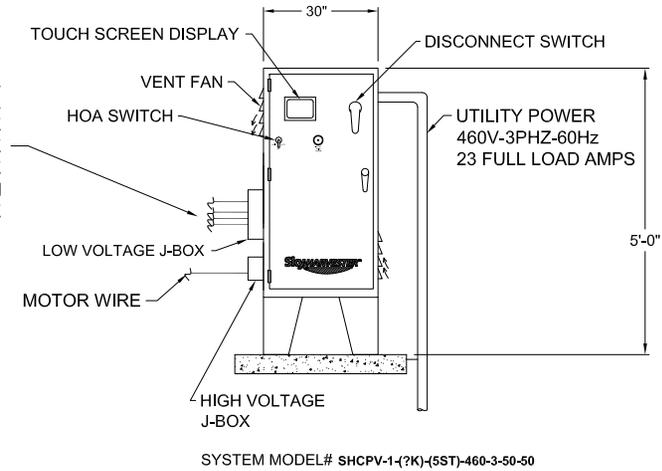
- PSI TRANSDUCER - SUPPLIED BY WT W/ 20FT WIRE
- PUMP FLOW SENSOR - SUPPLIED BY WT W/ 20FT WIRE
- CITY FLOW SENSOR - SUPPLIED BY WT W/ 20FT WIRE
- CITY FILL VALVE - SUPPLIED BY WT W/ 20FT WIRE
- LEVEL SENSOR AND FLOAT ASSEMBLY - SUPPLIED BY WT W/ 100FT WIRE EA
- 6" MOTORIZED BUTTERFLY VALVE - 120V-1 WIRE NOT INCLUDED
- 5HP MOTOR - NOT SUPPLIED BY WT, WIRE NOT INCLUDED

CONTROL PANEL TO INCLUDE:

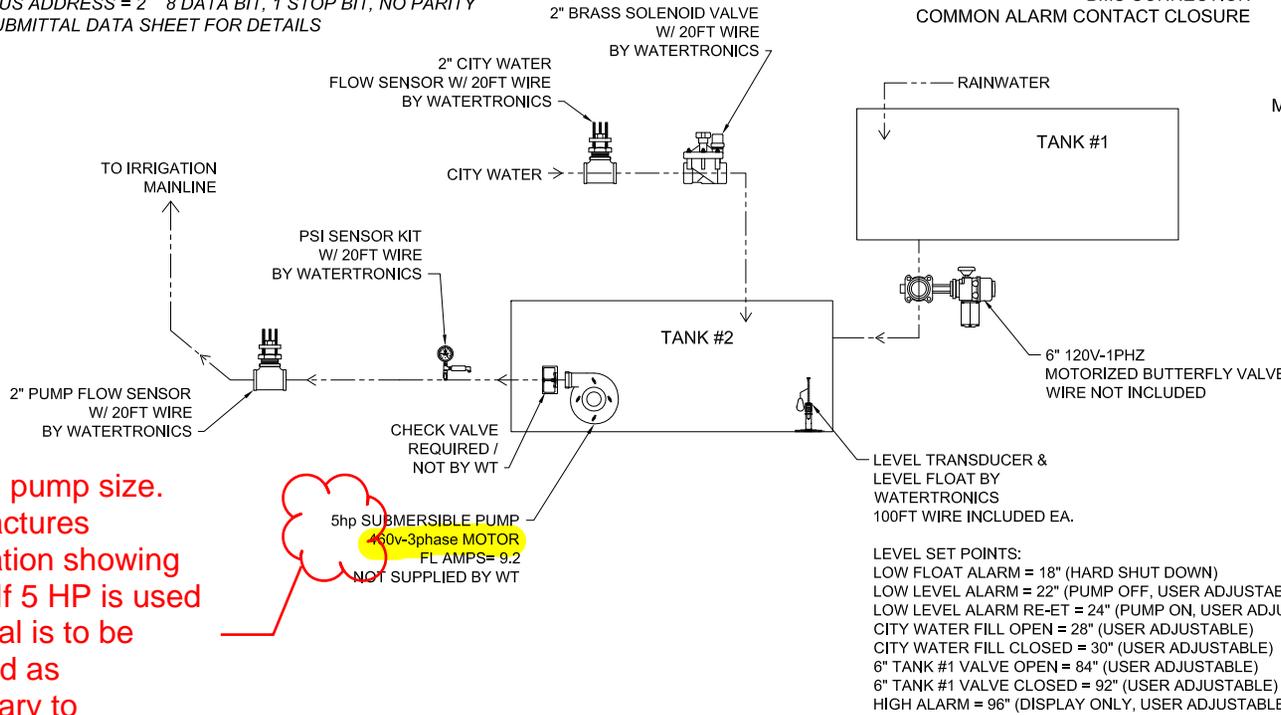
- COLOR TOUCHSCREEN OPERATOR INTERFACE
- FLOW SENSOR DISPLAY AND TOTALIZERS
- PSI DISPLAY AND SET POINTS
- AUTO RE-ENABLING OF PUMP BASED UPON WATER AVAILABILITY
- PUMP RUNNING STATUS & RUN-TIME HRS
- LEVEL CONTROLS AND DISPLAY IN "INCHES" & "GALLONS"
- USER ABILITY TO ADJUST ALL SYSTEM PARAMETERS
- VFD PRESSURE REGULATION FOR ENERGY EFFICIENCY
- BRANCH CIRCUIT PROTECTION
- U.L. 508 LISTED CONTROL PANEL ASSEMBLY
- PROGRAMABLE PLC "programmable logic controller"
- NON-FUSABLE MAIN DISCONNECT
- HOA (hand, off, auto) SWITCH FOR PUMP
- SERIAL MODBUS PLC CAPABILITY W/ RS232 & RS485 CONNECTION
- MODBUS ADDRESS = 2 8 DATA BIT, 1 STOP BIT, NO PARITY
- SEE SUBMITTAL DATA SHEET FOR DETAILS



LOCATED IN MECHANICAL ROOM 100 FT MAX DISTANCE AWAY FROM MOTOR



- LEVEL SENSOR & LEVEL FLOAT WIRE
- PUMP & CITY FLOW SENSOR WIRE
- PRESSURE TRANSDUCER WIRE
- 6" MOTORIZED VALVE WIRE
- 2" CITY WATER SOL. VALVE WIRE
- BMS CONNECTION
- COMMON ALARM CONTACT CLOSURE



confirm pump size. manufactures information showing 3 HP. If 5 HP is used electrical is to be adjusted as necessary to accommodate larger

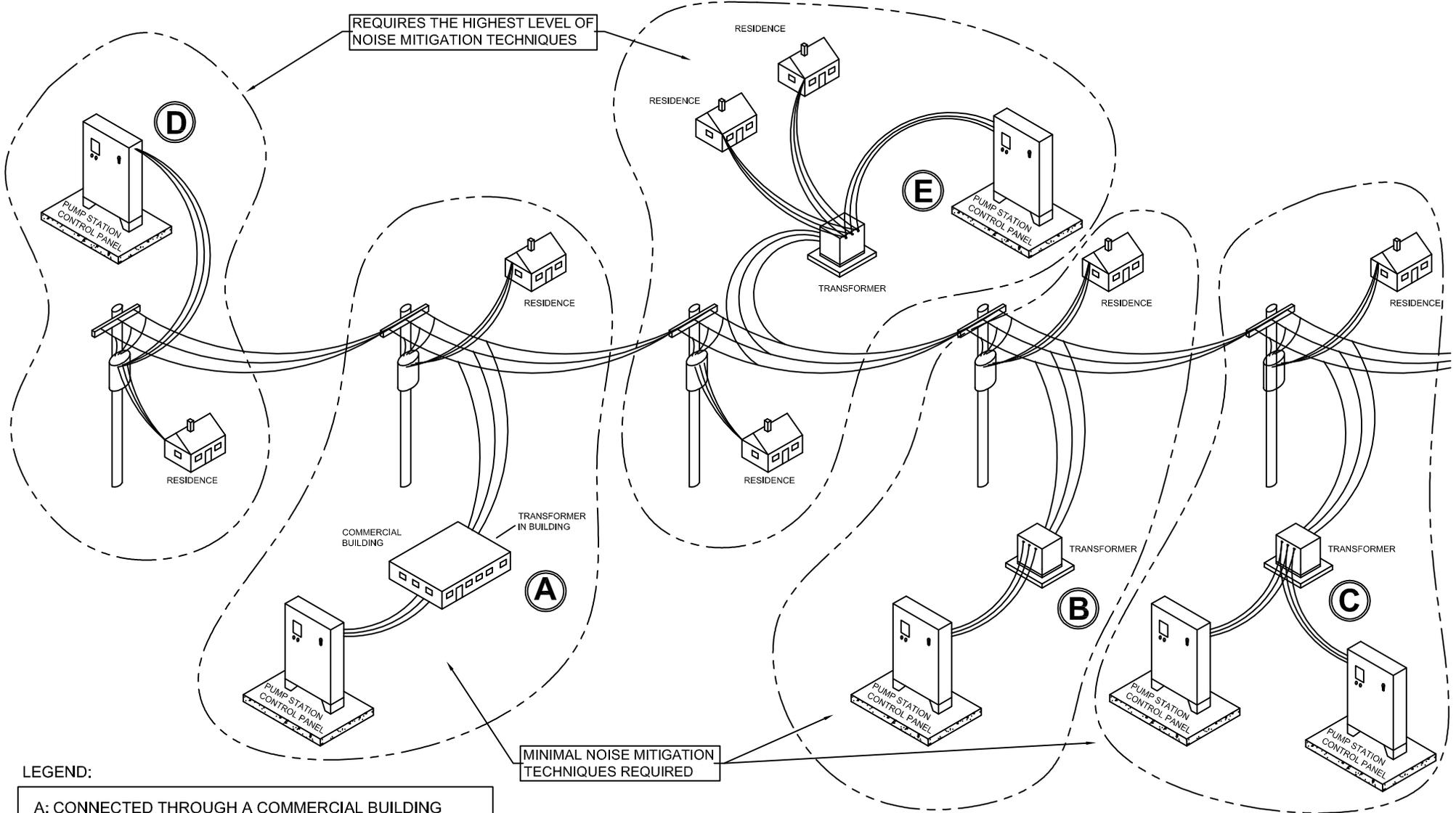
GENERAL NOTES:

- DO NOT RUN HIGH VOLTAGE WIRES IN SAME CONDUIT AS LOW VOLTAGE SIGNAL WIRES
- PUMP MUST HAVE CHECK VALVE IMMEDIATELY AFTER PUMP DISCHARGE
- PSI SENSOR MUST BE INSTALLED UPSTREAM OF ANY FILTRATION AND DOWNSTREAM OF CHECK VALVE
- LOCATE LEVEL SENSOR WHERE A PERSON CAN EASILY PULL UP FOR SERVICE, DO NOT BOLT DOWN.

- LEVEL SET POINTS:**
- LOW FLOAT ALARM = 18" (HARD SHUT DOWN)
 - LOW LEVEL ALARM = 22" (PUMP OFF, USER ADJUSTABLE)
 - LOW LEVEL ALARM RE-ET = 24" (PUMP ON, USER ADJUSTABLE)
 - CITY WATER FILL OPEN = 28" (USER ADJUSTABLE)
 - CITY WATER FILL CLOSED = 30" (USER ADJUSTABLE)
 - 6" TANK #1 VALVE OPEN = 84" (USER ADJUSTABLE)
 - 6" TANK #1 VALVE CLOSED = 92" (USER ADJUSTABLE)
 - HIGH ALARM = 96" (DISPLAY ONLY, USER ADJUSTABLE))

OPER APPROVAL SIGNATURE <input type="checkbox"/> APPROVED AS SUBMITTED <input type="checkbox"/> MAKE INDICATED CHANGES AND RESUBMIT	7				SCALE: NONE DRWN BY: MJW TITLE: SOMERVILLE HIGH SCHOOL RAINWATER PANEL
	6				
	5				
	4				
	3				
	2				
	1				
	NO.	DATE	BY	DESCRIPTION	DATE: 2/11/19 DRAWING NO. PRSH11116

INSTRUCTION: The Federal Communications Commission (FCC) has enacted electromagnetic interference limitations on industrial powered equipment when connecting to public power grids. The acceptable levels of interference/noise are dependent on the grid connection arrangement. For Watertronics to provide adequate noise protection for a given project, the grid connection must be determined. For your project, please confirm with your Watertronics representative which arrangement below applies.



LEGEND:

- A: CONNECTED THROUGH A COMMERCIAL BUILDING
- B: CONNECTED THROUGH A DEDICATED TRANSFORMER
- C: CONNECTED THROUGH A PAD TRANSFORMER SHARED WITH OTHER NON-RESIDENTIAL EQUIPMENT.
- D: CONNECTED TO A POLE TRANSFORMER ON A RESIDENTIAL POWER GRID.
- E: CONNECTED TO A PAD TRANSFORMER SHARED WITH RESIDENTIAL DWELLINGS.

MINIMAL NOISE MITIGATION TECHNIQUES REQUIRED

REQUIRES THE HIGHEST LEVEL OF NOISE MITIGATION TECHNIQUES

7				
6				
5				
4				
3	07/21/16	DJR	ENHANCE VISUAL CLARITY	
2	06/10/16	DJR	ADD NOTES, REARRANGE LAYOUT	
1	1/10/14	DJR	CHANGE NUMBERS TO LETTERS	
NO.	DATE	BY	DESCRIPTION	

THIS DRAWING AND DESIGN, IS THE PROPERTY OF WATERTRONICS AND IS NOT TO BE REPRODUCED IN WHOLE OR PART, NOR EMPLOYED FOR ANY PURPOSE OTHER THAN SPECIFICALLY PERMITTED IN WRITING BY WATERTRONICS. THIS DRAWING LOANED AND SUBJECT TO RETURN ON DEMAND

DESIGNED BY	SCALE: NONE	TITLE:
DRAWN BY: DJR	PAPER SIZE B	FCC COMPLIANCE GUIDELINES
CHECKED BY: ---	DATE: 2/27/2013	 A LINDSAY COMPANY
APPROVED BY: ---	DRWN BY: DJR	
PROJECT NO.	REF: ---	SHEET 1 OF 1 SHEETS
JOB NUMBER: N/A	APPD: ---	DRAWING NO. FCC-1
		REV 2



NITW.E142155 Industrial Control Panels

[Page Bottom](#)

Industrial Control Panels

[See General Information for Industrial Control Panels](#)

WATERTRONICS INC

E142155

525 Industrial Dr
Po Box 530
Hartland, WI 53029-0530 USA

Industrial control panels.

[Last Updated](#) on 2017-11-10

[Questions?](#)

[Print this page](#)

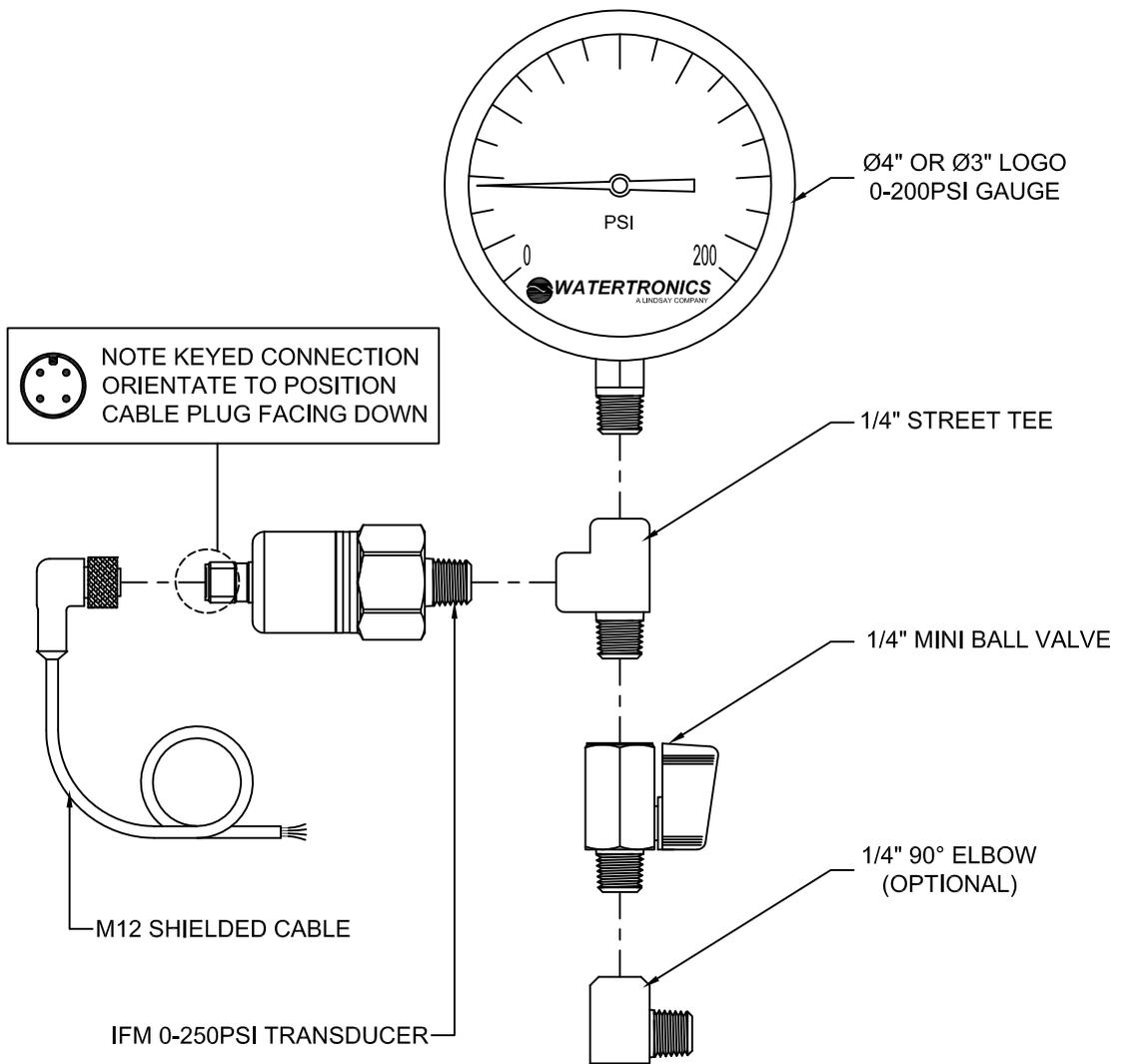
[Terms of Use](#)

[Page Top](#)

© 2018 UL LLC

The appearance of a company's name or product in this database does not in itself assure that products so identified have been manufactured under UL's Follow-Up Service. Only those products bearing the UL Mark should be considered to be Certified and covered under UL's Follow-Up Service. Always look for the Mark on the product.

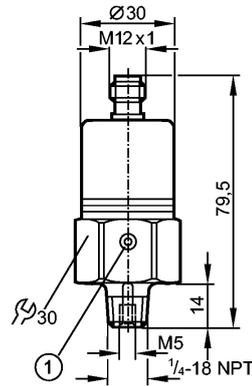
UL permits the reproduction of the material contained in the Online Certification Directory subject to the following conditions: 1. The Guide Information, Assemblies, Constructions, Designs, Systems, and/or Certifications (files) must be presented in their entirety and in a non-misleading manner, without any manipulation of the data (or drawings). 2. The statement "Reprinted from the Online Certifications Directory with permission from UL" must appear adjacent to the extracted material. In addition, the reprinted material must include a copyright notice in the following format: "© 2018 UL LLC".



PRESSURE TRANSDUCER ASSEMBLY

PX3234

Pressure sensors



1: ventilation



Made in Germany

Product characteristics

Electronic pressure sensor
Quick disconnect
Process connection: 1/4"NPT A / M5 I
e1 compliant
Analog output
Measuring range: 0...200 PSI

Application

Application	Type of pressure: relative pressure Liquids and gases
Pressure rating [PSI]	1087
Bursting pressure min. [PSI]	2175
Medium temperature [°C]	-25...90 ****)

Electrical data

Electrical design	DC
Operating voltage [V]	9.6...32 DC
Insulation resistance [MΩ]	> 100 (500 V DC)
Protection class	III
Reverse polarity protection	yes

Outputs

Output	Analog output
Output function	4...20 mA analog
Overload protection	yes
Analog output	4...20 mA
Max. load [Ω]	max. (Ub - 9.6 V) x 50; 720 at Ub = 24 V

Measuring / setting range

Measuring range [PSI]	0...200
-----------------------	---------

Accuracy / deviations

Accuracy / deviations (in % of the span)	
Characteristics deviation *)	< ± 0.35 (BFSL) / < ± 0.75 (LS)
Repeatability **)	< 0.1
Long-term stability ***)	< ± 0.05

PX3234

Temperature coefficients (TEMPCO) in the temperature range 0...80° C (in % of the span per 10 K)

Greatest TEMPCO of the zero point	0.15
Greatest TEMPCO of the span	0.2

Environment

Ambient temperature [°C]	-25...80
Storage temperature [°C]	-40...100
Protection	IP 65

Tests / approvals

EMC	EN 61000-4-2 ESD:	4 kV CD / 8 kV AD
	EN 61000-4-3 HF radiated:	30 V/m
	EN 61000-4-4 Burst:	2 kV
	EN 61000-4-6 HF conducted:	10 V
	radiation of interference	according to the automotive directive 2004/104/EC / CISPR25
	noise immunity HF radiated	according to the automotive directive 2004/104/EC / ISO 11452-2
	pulse resistance	100 V/m according to ISO7637-2 / severity level 3
Shock resistance	DIN IEC 68-2-27:	50 g (11 ms)
Vibration resistance	DIN IEC 68-2-6:	20 g (10...2000 Hz)

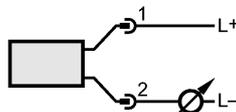
Mechanical data

Process connection	¼"NPT A / M5 I
Materials (wetted parts)	stainless steel (303S22); ceramics; FPM (Viton)
Housing materials	stainless steel 316L / 1.4404; FPM (Viton); PA; EPDM/X (Santoprene)
Min. pressure cycles	100 million
Weight [kg]	0.217

Electrical connection

Connection	M12 connector; gold-plated contacts
------------	-------------------------------------

Wiring



Remarks

Remarks	<p>*) BFSL = Best Fit Straight Line / LS = Limit Value Setting **) with temperature fluctuations < 10 K ***) in % of value of measuring range / 6 months ****) -40...90 °C upon request</p>
---------	---

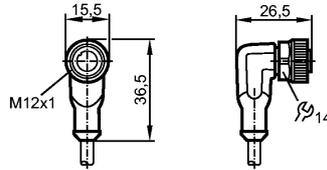
Other data

Step response time analogue output [ms]	3
---	---

EVC549

ADOAH050MSS0010K05

Connection technology



Product characteristics

Socket

For sensors with

M12 connector

Free from silicone

Free from halogen

gold-plated contacts

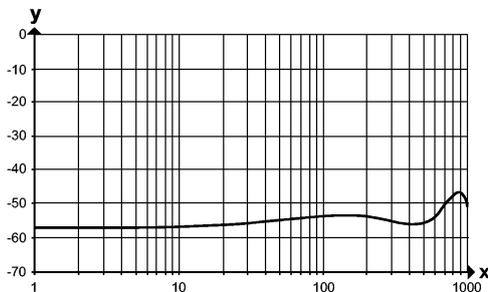
Electrical data

Electrical design		AC/DC
Operating voltage [V]		30 AC / 36 DC
Current rating [A]		4
Protection class		III

Schirmdämpfungskennlinie

x: Frequency in [MHz]

y: Schirmdämpfung in [dB]



Environment

Ambient temperature [°C]		-25...90
Ambient temperature (moving) [°C]		-25...90
Protection		IP 65 / IP 67

Mechanical data

Design		angled
Material body		housing: TPU (urethane) orange; sealing: Viton
Material nut		brass; nickel-plated
Tightening torque for knurled nut [Nm]		0.6...1.5
Drag chain suitability		<p>Bending radius for flexible applications:</p> <p>min. 10 x cable diameter max. 3.3 m/s for a horizontal travel length of 5 m and max. acceleration of 5 m/s²</p> <p>Travel speed:</p> <p>Bending cycles:</p> <p>Torsional strain:</p> <p>≥ 2 million ± 180 °/m</p>
Weight [kg]		0.399

Electrical connection



EVC549

ADOAH050MSS0010K05

Connection technology

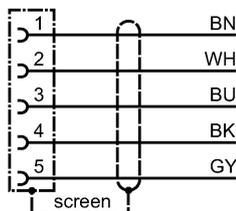
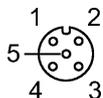
Connection	PUR cable / 10 m; 5 x 0.25 mm ² (32 x Ø 0.1 mm); Ø 4.9 mm; halogen-free, screened, screen connected to the socket
------------	---

Sheath color	black
--------------	-------

Wiring

Core colors

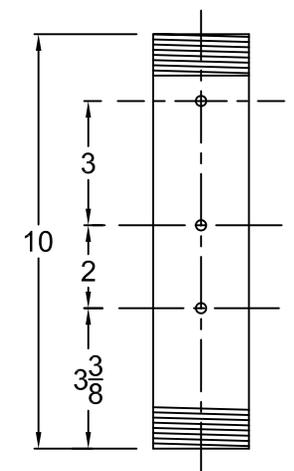
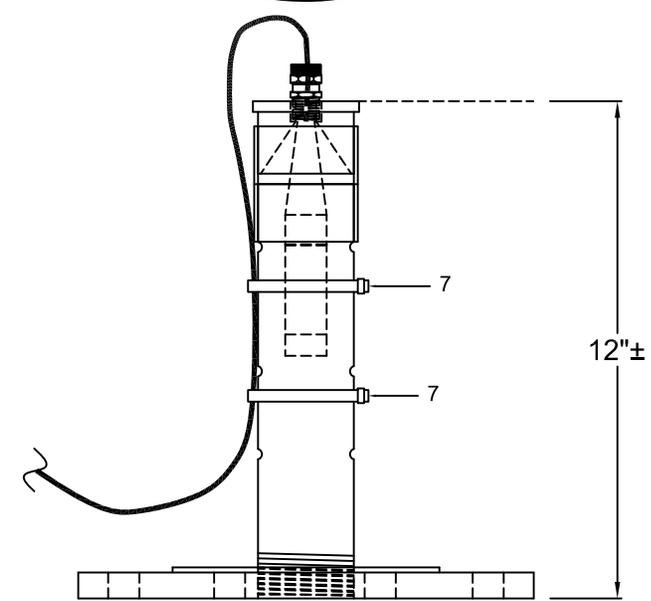
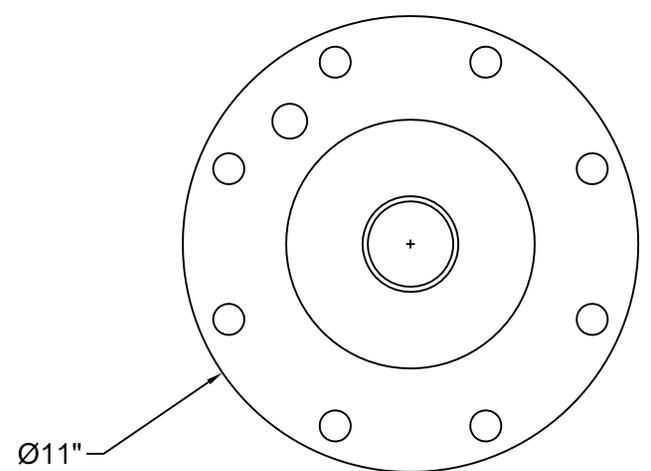
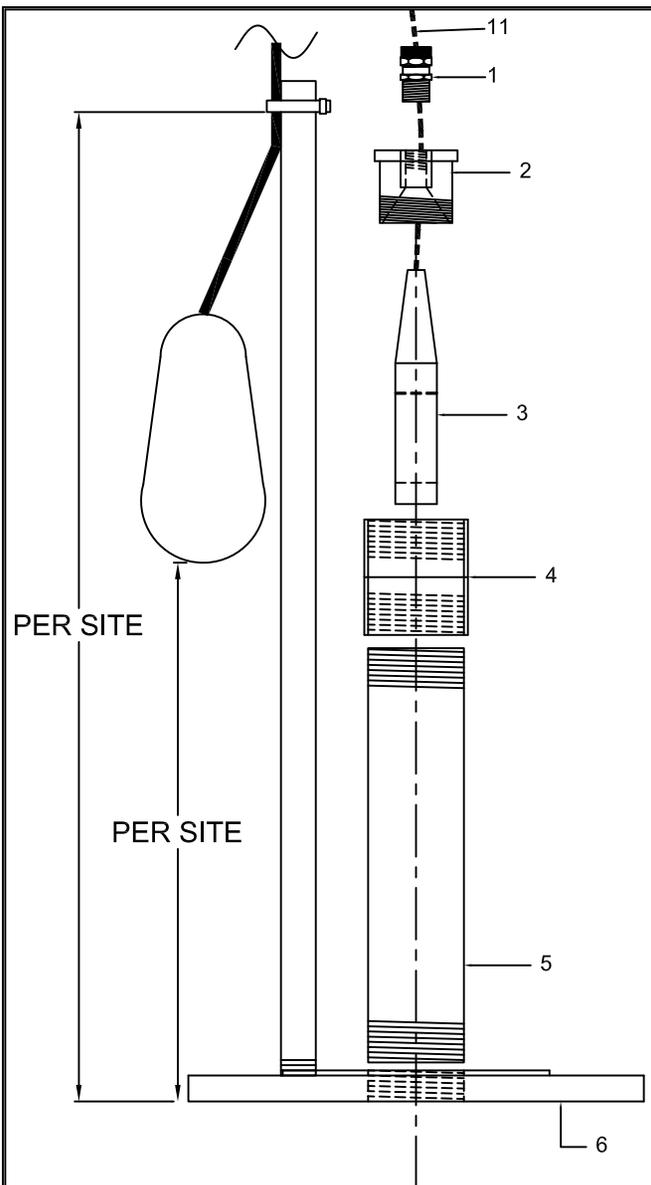
- BK black
- BN brown
- BU blue
- GY grey
- WH white



Remarks

Pack quantity	[piece]	1
---------------	---------	---

ifm efector, inc. 782 Springdale Drive, Exton, PA 19341 — We reserve the right to make technical alterations without prior notice. — US — EVC549 — 19.07.2013



BILL OF MATERIAL					
ITEM	QTY.	CODE	PART/NO.	DESCRIPTION	PULLED
1	1		31-80-0375	CORD GRIP	
2	1		31-10-0209	(1-1/2\"/>	

PER SITE
PER SITE

7				
6				
5				
4				
3				
2				
1	03/15/2012	WTS	CHANGED TRANSDUCERS, WAS 69-22-0016	
NO.	DATE	BY	DESCRIPTION	

THIS DRAWING AND DESIGN, IS THE PROPERTY OF WATERTRONICS AND IS NOT TO BE REPRODUCED IN WHOLE OR PART, NOR EMPLOYED FOR ANY PURPOSE OTHER THAN SPECIFICALLY PERMITTED IN WRITING BY WATERTRONICS. THIS DRAWING LOANED AND SUBJECT TO RETURN ON DEMAND

TOLERANCES UNLESS NOTED	SCALE: 1:3	TITLE:
DECIMAL	PAPER SIZE B	SUBMERSIBLE TRANSDUCER STAND
FRACTION	DATE: 11/05/2010	
ANGULAR	DRWN BY: RJS	WATERTRONICS
	CHK'D: RJS	ELECTRONICALLY CONTROLLED PUMPING SYSTEMS
	APP'D:	HARTLAND, WISCONSIN
REF: —	SHEET 8 OF 12 SHEETS	REV
JOB NUMBER: 2010312	DRAWING NO. MD10527	0

Control Duty Mechanical Narrow Angle Switch

Designed for accurate liquid level control in many applications including potable water or sewage environments. The float switch can be utilized to signify specific water levels or for direct alarm actuation.

The mechanically activated micro switch is designed to operate under a min/max temperature of 32-190° F, and has an electrical rating of 10 AMPS @ 120 VAC or 5 AMPS @ 240 VAC. The power cord is a chlorinated polyethylene type SJ00W-300 Volt on 16/2 for N/O or N/C switch or 16/3 for SPDT switch.

The float is constructed of a durable ABS material, and is tested and proven to be leak proof, shock proof, and impact resistant. The cord weight is made of zinc plated cast iron. At 1.22 lbs. the split weight design allows for easy adjustment, and a secure and permanent attachment to the cord.

NORMALLY OPEN (N/O)

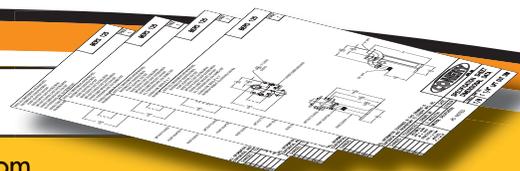
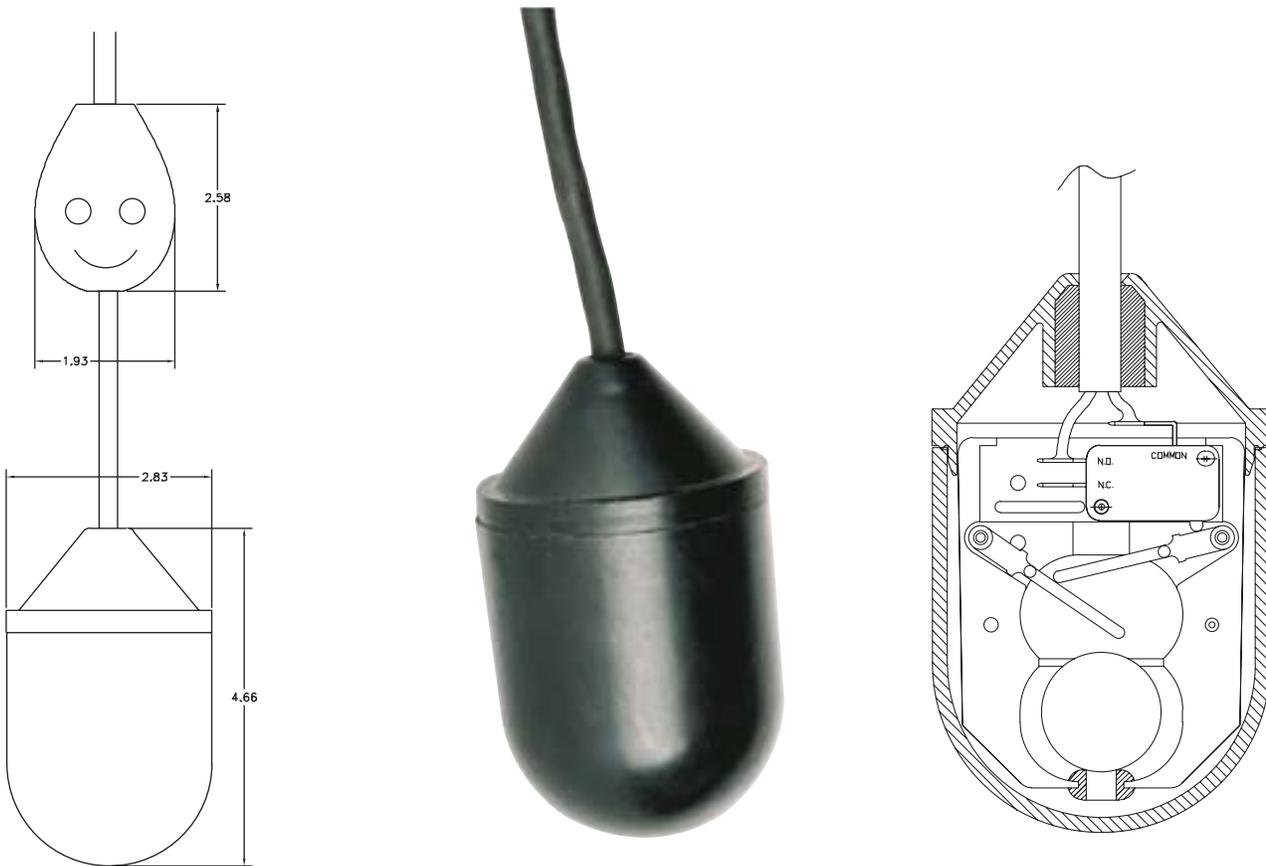
As the float rises 1" (5°) above horizontal, the contacts become closed and actuate (turn on) the switch. This float is generally used in pump down applications.

NORMALLY CLOSED (N/C)

As the float rises 1" (5°) above horizontal, the contacts become open and actuate (turn off) the switch. This float is generally used in pump up applications.

SINGLE POLE, DOUBLE THROW (SPDT)

A variation of the N/O & N/C, this float switch can be wired to operate as either (but not both) a normally open or a normally closed switch based on the user's need.



Type 1008S Stainless Case Gauge with Stainless Steel System



FEATURES

- Patented PowerFlex™ movement
- All stainless steel welded construction
- True Zero™ pointer indication
- NEW ventable plug
- NEW MSL helium leak tested to 1×10^{-6} ATM -cc/sec
- RoHS compliant
- CRN approved
- 1 year limited warranty
- Exceeds ASME B40.100 grade B
- Meets EN837-1 upon request for 63mm dial size (order variation "XER")

Ashcroft is pleased to reintroduce the 1008S pressure gauge. This gauge has been upgraded with many new features outlined above while maintaining the tried and true performance and quality you have come to expect.

Type 1008S gauges provide significant features and benefits. New features include a ventable plug that can be sealed or vented depending on your environment.

The combination of features including the patented PowerFlex™ movement and optional PLUS!™ Performance⁽²⁾ dampening system in the Ashcroft 1008S gauge is the finest gauge technology for vibration, shock and pulsation applications. Available in pressure ranges from vacuum to 15,000 psi, including compound and metric ranges.

FILL TYPE	Min/Max Temperature Limits ⁽²⁾		
	Ambient	Process	Storage
DRY (w/Polycarbonate Window)	-40/200°F	-40/250°F	-40/250°F
GLYCERIN	20/150°F	20/200°F	0/150°F
SILICONE	-40/150°F	-40/200°F	-40/150°F
HALOCARBON	-40/150°F	-40/200°F	-40/150°F

PRODUCT SPECIFICATIONS

Ashcroft Type No.:	1008S
Sizes:	63mm, 100mm
Case:	304SS
Ring:	304SS crimped
Window:	Polycarbonate
Dial:	Black figures on white background, aluminum
Pointer:	Friction adjust, black, aluminum
Bourdon Tube:	316L stainless steel C-Shaped (vacuum-600 psi and compound) Helical (1000 psi-15000 psi)
Socket:	316L stainless steel
Movement:	300 series stainless steel, PowerFlex, polyester segment, overload/underload stops
Connections:	1/8 and 1/4 NPT, lower or lower back 1/2 NPT lower (100mm) only
Ranges:	Vac-15000 psi and compound
Accuracy:	1.6% full scale ⁽¹⁾
Fill Plug:	Ventable
Protection:	Nema 4X / IP65 plug sealed Nema 3 / IP54 plug vented

OPTIONAL FEATURES

Liquid fill:	Glycerin, silicone, halocarbon (includes throttle plug)
Dampening:	PLUS!™ Performance (LL) ⁽²⁾ (includes throttle plug)
Connections:	Metric and SAE on request
Mounting:	U-clamp (UC), Front flange (FF),
Dials:	Receiver ranges, refrigerant ranges; custom dials

⁽¹⁾ When these gauges are liquid filled the total gauge accuracy may be as much as 2.0%

⁽²⁾ XLL PLUS!™ design is not recommended for gauges expected to be exposed to temperatures over 200°F (93°C). This includes gauges subject to autoclaving.

HOW TO ORDER (Typical example)

63 1008 S (L) 02L XXX 100#

Dial Size: 63mm (63), 100mm (10) _____

Case Type: 1008 _____

Tube and Socket Material: 316L SS _____

Liquid Filled: (glycerin) leave blank if dry _____

Connection Size: 1/8 (01), 1/4 (02), 1/2 (04) 100mm lower only _____

Connection Location: Lower (L), Lower Back (B) _____

Options: _____

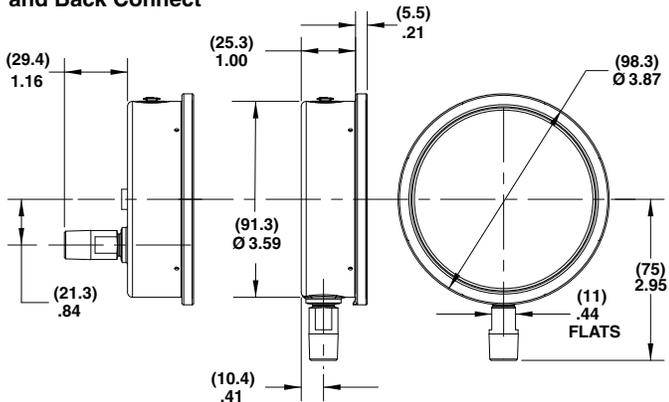
Range: 0/100 psi _____

Type 1008S Stainless Case Gauge with Stainless Steel System

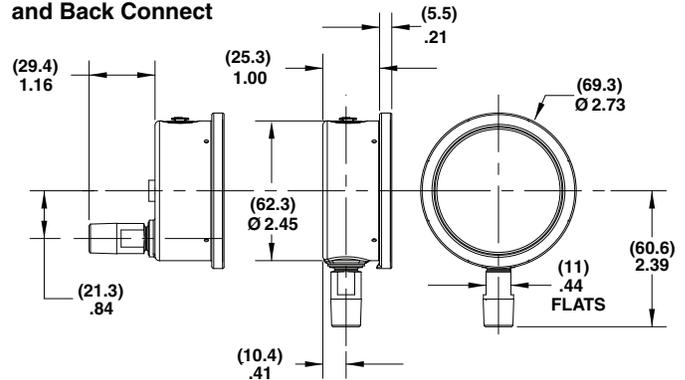
DIMENSIONS

All dimensions in brackets () are millimeters.

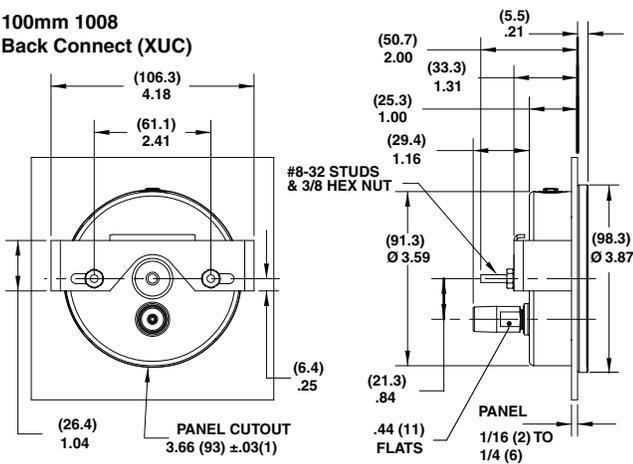
100mm 1008 Lower and Back Connect



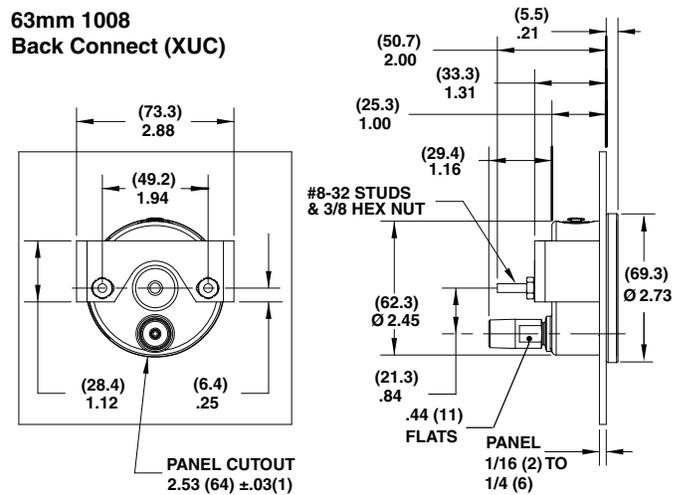
63mm 1008 Lower and Back Connect



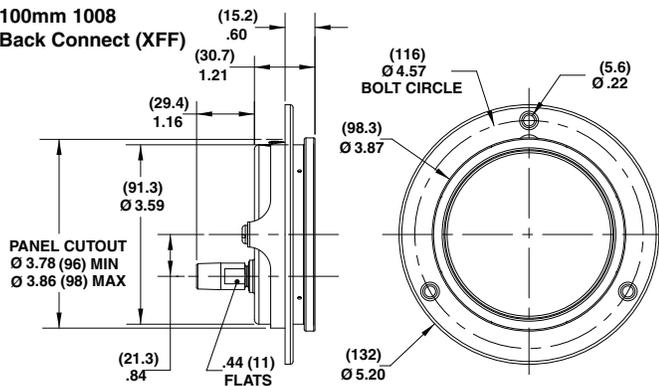
100mm 1008 Back Connect (XUC)



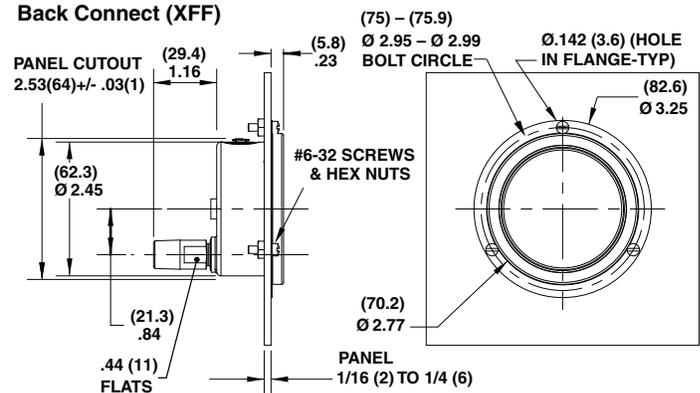
63mm 1008 Back Connect (XUC)



100mm 1008 Back Connect (XFF)



63mm 1008 Back Connect (XFF)



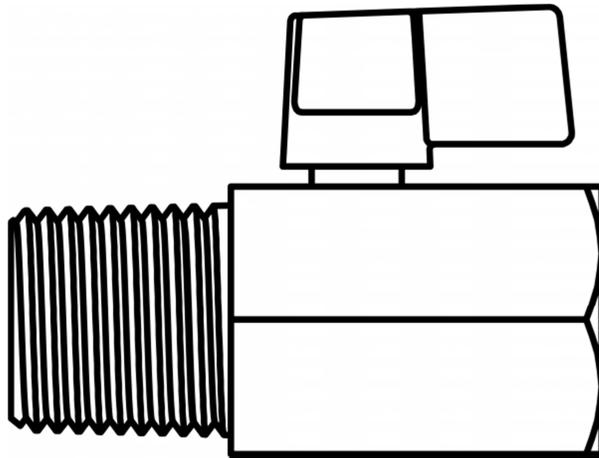
Male x Female Mini Ball Valve

- Chrome Plated Brass
- One-Piece
- Reduced Port
- Double O-Ring Packing
- Blowout-Proof Stem
- PTFE Seats

Pressure Rating: 450 PSI

Operating Temperature Range: -4° F to 212° F

Handle Type: 1/4 Turn Aluminum



SkyHarvester Control Panel

Integrating the finest materials and control software for superior performance

Controls can be configured to handle from 1 to 13 main pumps with optional equipment accessories and alarms. All panels are 100% tested to full design parameters to simulate on site conditions prior to shipment. All panels are built at Watertronics Hartland, WI manufacturing facility. To insure the highest level of service and functionality, all software is written in house by experienced Watertronics programmers.

Standard Features

- UL listed NEMA 4 control panel with through-the-door main disconnect motor starters and VFD
- Variable Frequency Drive (VFD) with integral input line reactor (transient suppression)
- Microprocessor controller with AccuWare station control software to maintain constant pressure at variable flow
- Lightning surge protection
- VirtualVision III 7.5" Color Touchscreen operator interface with full color TFT Active Matrix LCD display and memory card for over one year of data history
- Current flow and pressure display
- Pump running status and run time hours
- Alarm status and logs the time, date, flow and control functions such as self-flushing inlet screens, discharge filters and wye strainers
- Tank level controls with fill valve or fill pump activation and status display
- Password protected programming screens
- Filter Control Screen
- Time of use lock out screen (digital timer)
- Water Harvesting Overview screen with tank graphic, level display in "inches" and "gallons", real time percentage level gauge, total gallons used, total harvested water used, re-settable gallons used
- Water level controls screen
- Individual run time monitoring
- High discharge/Low discharge pressure alarm
- Low water level alarm w/ auto re-set
- Filter alarm with (3) auto retries
- Control Power alarm
- Pipe fill alarm (system can not pressureize)
- VFD fault alarm
- Low Low water level alarm
- On/Off/Auto switches for all pumps
- Dual mechanically interlocked output contactors for automatic alternation of pumps (multiple pumps)
- Fan & Filter or Water to air heat exchanger cooling
- Key-lock panel security
- Individual circuit breaker motor protection rated for 200,000 A.I.C.



Configuration may vary

Options

- Watervision 6 for SkyHarvester remote monitoring software. Connection to world wide web via ethernet or cellular modem.
- NEMA 4x materials available upon request
- Power Monitor. Displays in real time and records lifetime and user re-settable power consumption.
- Serial MODBUS communication card. Includes list of PLC registers, values, and units.

Sigma PLC Com Card

MJW – 1/18/18

The Watertronics FP-Sigma PLC has the ability to communicate with exterior devices such as data loggers, or building management systems via the PLC Com Card. The Com Card can communicate via MODBUS RTU protocol. Watertronics will provide a list of PLC registers and their unit, and names for coordination with exterior devices. The Com Card is an available option and must be selected at time of quotation and purchase.

Available Cards

Com Card #1 = (1) RS232 connection

Com Card #2 = (2) RS232 connections

Com Card #4 = (1) RS232 and (1) RS485 connection

Baud Rate for RS232 connections can be 1200 to 115,200 (standard increments)

Default for RS232 is 9600 baud

Baud Rate for RS485 is only selectable via dip switch on Com Card 4 with options of 19,200 or 115,200 baud. The dip switch settings and PLC programming must match for RS485 connection to function.

If Watvision remote monitoring is also included on the pump station this will consume a single RS232 connection.

~~Default MODBUS address is "1"~~

ADDRESS = 2

Default Settings = 8 data bits, Parity=NONE, 1 stop bit



Registers labeled REAL are LSW x MSW format (least significant word, most significant word)

If Com Card is part of a new pump station purchase, and installed from factory, wire terminals will be provided for customer to land wires from exterior device. See Watertronics wiring diagram for details. Customer will not need to land wires on Com Card directly inside panel on side of PLC. (see next page)

Tank/Reservoir Fill Level Drop to Start Source #1 (subtract this value from Off level to get On level) (inches)	46040	INT16
Total Harvested Water Used Lifetime counter (1k gallons)	40839 (Only if back-up source does not feed tank)	INT32
Total Alternate/back-up water used Source #1 Lifetime counter (1k gallons)	44054	INT32
Alternate/back-up water Source #1 current flow rate (GPM)	44042	INT32
Total Power Consumption Lifetime Counter (KW/H)	44014	REAL
Current Power Draw (KW)	44012	REAL
Alternate Water Source #1 On/Off status	06064	BOOL

Non-fusible Disconnect switches



Non-fusible disconnect switches
16A – 3150A, 600V

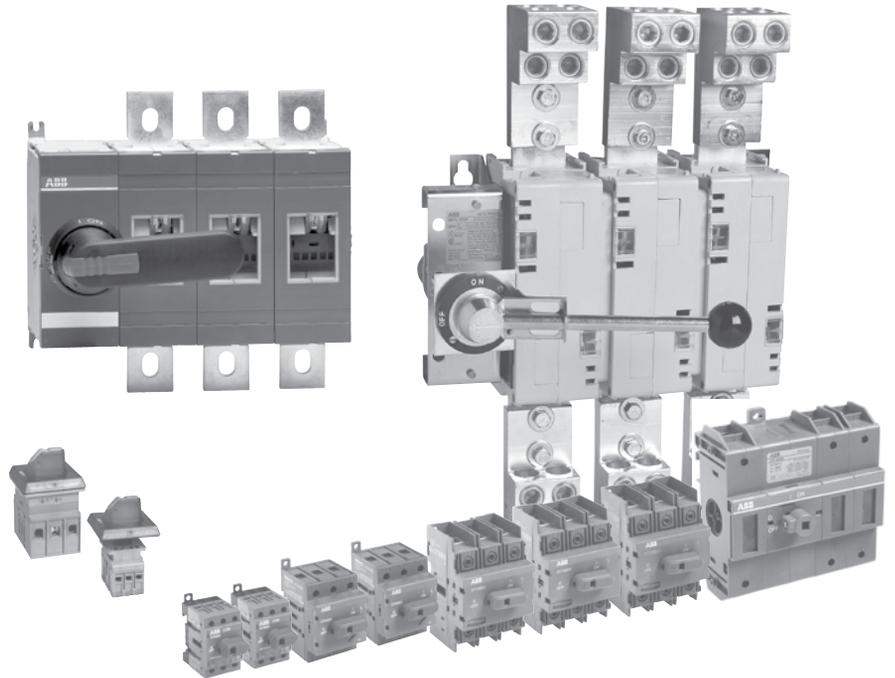


ABB SwitchLine includes 16 different amperage sizes from 16A to 3150A. The basic construction provides flexibility, safety, and high performance in an extremely compact size. ABB SwitchLine is a perfect choice for all switching applications from industrial motor control to construction safety switches.

International acceptance

UL listed, CSA approved, IEC rated, CE marked, and most other international standards.

UL98 (CSA 22.2 No.4) – UL File # E101914, CSA File #LR58077

For OT30, OT60, OT100, OT125, OT200, OT400, OT600, OETL-NF800 – OETL-NF2000 switches, OH_ pistol grip handles

Suitable for use as motor disconnects or industrial control panel disconnects on service entrance equipment, panelboards, switchboards, industrial control equipment, motor control centers, etc. and are horsepower rated and ampere rated.

UL508 (CSA 22.2 No. 14) – UL File # E63822, CSA File #LR58247

For OT16 – OT80 switches, OH_ selector handles

Suitable for use in equipment or machinery as motor controllers & motor disconnects and are horsepower and ampere rated.

IEC

Tested in accordance to IEC 947-1 and 3, IEC 664, IEC 269, and IEC 204

CE

Compliance with the European Machine Directive IEC 204 (EN 60204)

General information

Selection guide

OT16F3 – OT160E3



Catalog number	3 pole	OT16F3	OT25F3	OT40F3	OT63F3	OT80F3	OT30F3	OT60F3	OT100F3
General purpose amp rating	A	16	25	40	60	80	30	60	100
Approvals ①									
	2 pole	N/A							
	3 pole	UL508	UL508	UL508	UL508	UL508	UL98	UL98	UL98
	4 pole	UL508	UL508	UL508	UL508	UL508	UL98	UL98	UL98
Technical ratings – UL, CSA ②									
Max operating voltage	V	600	600	600	600	600	600	600	600
Max horsepower rating									
Three phase									
240V	HP	5	7.5	10	15	20	10	20	30
480V	HP	10	15	20	30	40	20	40	50
600V	HP	10	20	25	30	40	30	40	50
Single phase									
120V	HP	1	1.5	2	2	2	2	3	5
240V	HP	2	3	5	5	5	5	7.5	15
Technical ratings – IEC ②									
Rated insulation and operational voltage, AC20 and DC20	V	750	750	750	750	750	750	750	750
Rated thermal current, I _n									
AC 20/DC 20 open	A	25	32	40	63	80	40	63	115
AC 20/DC 20 enclosed	A	25	32	40	63	80	40	63	115
AC 21A ≤500V	A	16	25	32	63	80	40	63	100
AC 21A ≤690V	A	16	25	32	63	80	40	63	100
Rated operational power AC23									
400/415V	kW	7.5	9	11	22	37	15	18.5	37
690V	kW	7.5	9	11	15	18.5	15	15	37
Physical characteristics									
Weight ③	3 pole	lb	0.24	0.24	0.24	0.59	0.59	0.79	0.79
Dimension	3 pole								
	H	in	2.68	2.68	2.68	3.60	3.60	3.94	3.94
	W	in	1.38	1.38	1.38	2.07	2.07	2.76	2.76
	D	in	2.20	2.20	2.20	2.85	2.85	2.95	2.95
Accessories									
Terminal lug kit		Integral							
Terminal shroud		•	•	•	•	•	•	•	•
Auxiliary contact		•	•	•	•	•	•	•	•
Shaft/handle diameter		6mm .24" x .24"							
Handle UL/NEMA type									
Type 1, 3R, 12		•	•	•	•	•	•	•	•
Type 1, 3R, 4, 4X, 12		•	•	•	•	•	•	•	•
Handle type									
Selector		•	•	•	•	•	—	—	—
Pistol		•	•	•	•	•	•	•	•
Recommended pistol handle length		45 - 65mm							
Maximum recommended shaft length		290mm							
Conversion kits									
6 pole		•	•	•	•	•	•	•	•
Transfer		•	•	•	•	•	•	•	•
Bypass		•	•	•	•	•	•	•	•
Mechanical interlock		•	•	•	•	•	•	•	•
Electrical interlock		—	—	—	—	—	—	—	—

• = Available
— = Not available

① UL listed switches are also CSA approved.
② For complete technical information please see page 18.38 – 18.70.
③ Switch only.



DIN rail plug-in Surge Protector for dataline/telecom

DLA



DLA surge protectors are designed to protect, against surge voltages due to lightning, terminals equipment connected to industrial buses, telecom lines or datalines.

These surge protectors must be installed on symmetrical DIN rail and are available for most of the transmission lines : line voltage from 6 to 170 V, bitrate up to 10 Mbit/s.

Electrical diagrams are built with gas tubes and fast clamping diodes in order to provide high discharge current capability and fast operation.

These products are 1-pair surge protectors with removable module for easy maintenance (spare module : P/N DLAM...). Transmission and protection of the shield wire by gas tube. Direct earthing through DIN rail. Line continuity in case of plug-in module removal.

Specific versions :

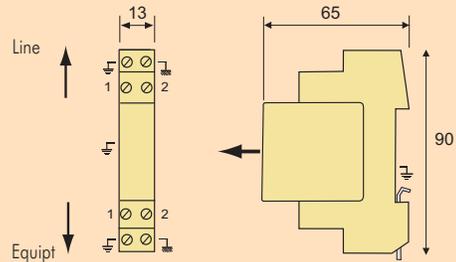
DLAW : in this version, the removal of the plug-in module will cut the line transmission off.

DLAH : version designed for lines with higher line current (remote supply...) up to 2,4 A.

C10

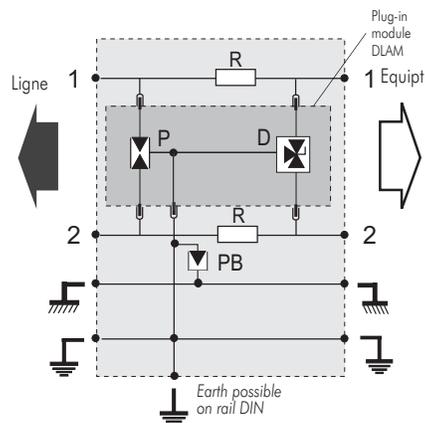
- Pluggable surge protection for «DIN» mounting
- All types of Telephone and Data lines
- Shield wire protection
- Without (DLA) or with (DLAW) line cut-off.
- IEC 61643-21 compliance

Dimensions (in mm)

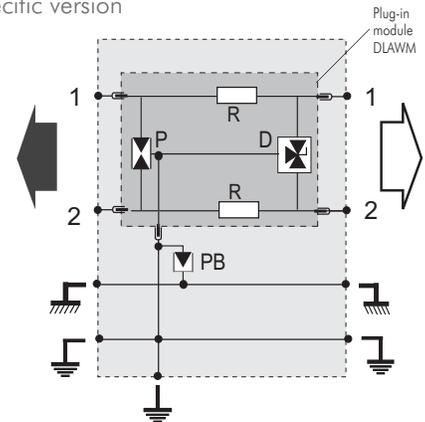


Electrical diagrams

DLA standard version



DLAW specific version



P : 3-electrode gas tube
 Pb : 2-electrode gas tube
 R : Resistor
 D : Clamping diode

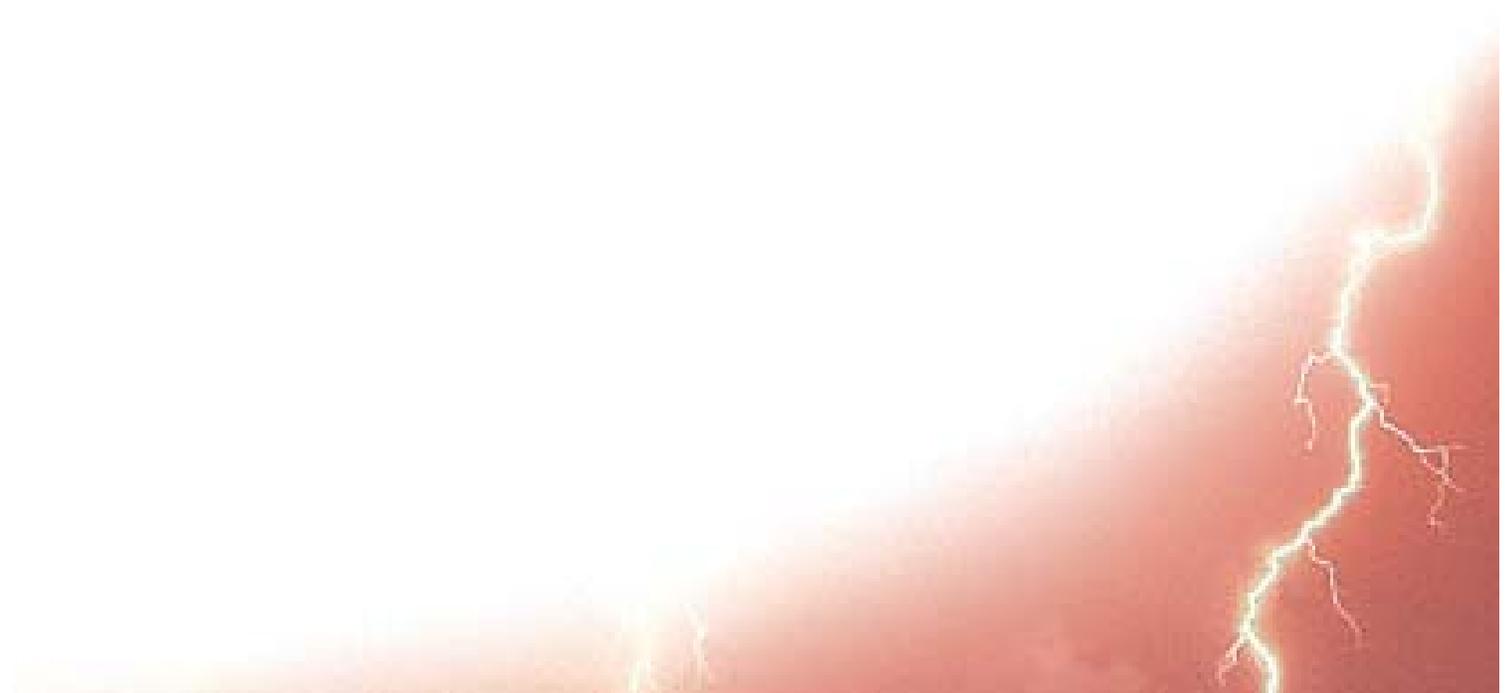


DIN rail surge protector for dataline/telecom

DLA

Characteristics

Référence CITEL	DLA-170	DLA-48D3	DLA-24D3	DLA-12D3	DLA-06D3	DLA-06DBC
Utilisations type	Telephone line ADSL	ISDN-T0 48 V line	Leased line 4-20 mA	RS232	RS422 RS485	MIC/T2 10BaseT
Configuration	1 pair+shield	1 pair+shield	1 pair+shield	1 pair+shield	1 pair+shield	1 pair+shield
Nominal line voltage (Un)	150 V	48 V	24 V	12 V	6 V	6 V
Max. line voltage (Uc)	170 V	53 V	28 V	15 V	8 V	8 V
Max. line current	300 mA	300 mA	300 mA	300 mA	300 mA	300 mA
Protection level (Up) 8/20µs impulse - 5 kA	220 V	70 V	40 V	30 V	20 V	25 V
Nominal discharge current (In) 8/20µs impulse - 10 times	5 kA	5 kA	5 kA	5 kA	5 kA	5 kA
Max. discharge current (Imax) 8/20µs impulse - 1 time	20 kA	20 kA	20 kA	20 kA	20 kA	20 kA
Impulse current (Iimp) 10/350µs impulse - 2 times	5 kA	5 kA	5 kA	5 kA	5 kA	5 kA
Type of diagram	D	D	D	D	D	D
End of life	Short-circuit	Short-circuit	Short-circuit	Short-circuit	Short-circuit	Short-circuit
Spare module	DLAM-170	DLAM-48D3	DLAM-24D3	DLAM-12D3	DLAM-06D3	DLAM-06DBC
Versions	DLA-xxx : standard version (line continuity in case of removal of plug-in module) DLAW-xxx : specific version (line cut-off in case of removal of plug-in module) DLAH-xxx : «remote supply» version (max. line current = 2,4 A)					
Mechanical specifications	Symmetrical DIN rail mounting Dimensions : see drawing Connection by screw - min/max. cross section 0,4/1,5 mm ² Housing material : Thermoplastic UL94-V0 Earth connection via DIN rail and screw terminal					





■ Features :

- Universal AC input/Full range
- Protections: Short circuit / Overload / Over voltage
- Cooling by free air convection
- Can be installed on DIN rail TS-35/7.5 or 15
- NEC class 2 / LPS compliant (24V,48V only)
- LED indicator for power on
- DC OK relay contact
- No load power consumption<0.75W
- 100% full load burn-in test
- 3 years warranty

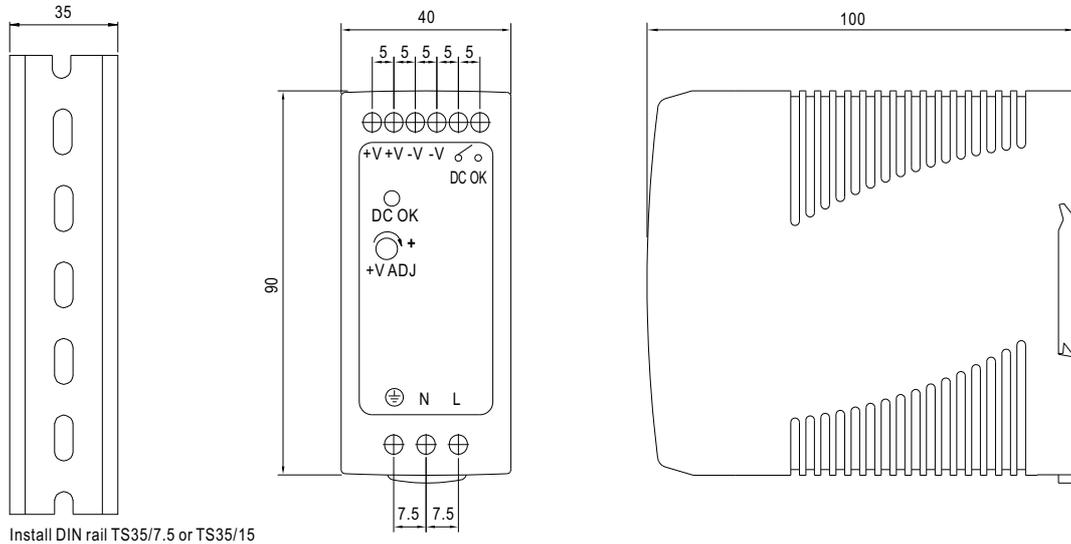


SPECIFICATION

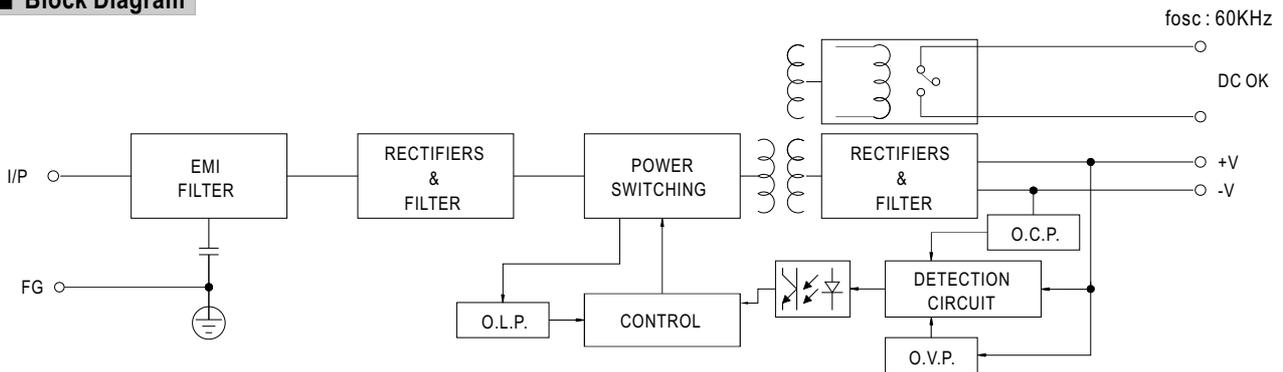
MODEL	MDR-60-5	MDR-60-12	MDR-60-24	MDR-60-48	
OUTPUT	DC VOLTAGE	5V	12V	24V	48V
	RATED CURRENT	10A	5A	2.5A	1.25A
	CURRENT RANGE	0 ~ 10A	0 ~ 5A	0 ~ 2.5A	0 ~ 1.25A
	RATED POWER	50W	60W	60W	60W
	RIPPLE & NOISE (max.) Note.2	80mVp-p	120mVp-p	150mVp-p	200mVp-p
	VOLTAGE ADJ. RANGE	5 ~ 6V	12 ~ 15V	24 ~ 30V	48 ~ 56V
	VOLTAGE TOLERANCE Note.3	±2.0%	±1.0%	±1.0%	±1.0%
	LINE REGULATION	±1.0%	±1.0%	±1.0%	±1.0%
	LOAD REGULATION	±1.5%	±1.0%	±1.0%	±1.0%
	SETUP, RISE TIME Note.5	500ms, 30ms/230VAC 500ms, 30ms/115VAC at full load			
HOLD UP TIME (Typ.)	50ms/230VAC 20ms/115VAC at full load				
INPUT	VOLTAGE RANGE	85 ~ 264VAC 120 ~ 370VDC			
	FREQUENCY RANGE	47 ~ 63Hz			
	EFFICIENCY (Typ.)	78%	86%	88%	87%
	AC CURRENT (Typ.)	1.8A/115VAC 1A/230VAC			
	INRUSH CURRENT (Typ.)	COLD START 30A/115VAC 60A/230VAC			
	LEAKAGE CURRENT	<1mA / 240VAC			
PROTECTION	OVERLOAD	105 ~ 150% rated output power Protection type : Constant current limiting, recovers automatically after fault condition is removed			
	OVER VOLTAGE	6.25 ~ 7.25V	15.6 ~ 18V	31.2 ~ 36V	57.6 ~ 64.8V
		Protection type : Shut down o/p voltage, re-power on to recover			
FUNCTION	DC OK SIGNAL	Relay contact rating(max.): 30V/1A resistive			
ENVIRONMENT	WORKING TEMP.	-20 ~ +70°C (Refer to "Derating Curve")			
	WORKING HUMIDITY	20 ~ 90% RH non-condensing			
	STORAGE TEMP., HUMIDITY	-40 ~ +85°C, 10 ~ 95% RH			
	TEMP. COEFFICIENT	±0.03%/°C (0 ~ 50°C)			
	VIBRATION	Component : 10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes ; Mounting : Compliance to IEC60068-2-6			
SAFETY & EMC (Note 4)	SAFETY STANDARDS	UL508, UL60950-1, TUV EN60950-1 approved, NEC class 2 / LPS compliant (24V,48V only)			
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC I/P-FG:1.5KVAC O/P-FG:0.5KVAC			
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:>100M Ohms / 500VDC / 25°C / 70% RH			
	EMC EMISSION	Compliance to EN55011, EN55022 (CISPR22), EN61204-3 Class B, EN61000-3-2,-3			
	EMC IMMUNITY	Compliance to EN61000-4-2, 3, 4, 5, 6, 8, 11, EN55024, EN61000-6-2, EN61204-3, heavy industry level, criteria A			
OTHERS	MTBF	299.2K hrs min. MIL-HDBK-217F (25°C)			
	DIMENSION	40*90*100mm (W*H*D)			
	PACKING	0.33Kg; 42pcs/14.8Kg/0.82CUFT			
NOTE	<ol style="list-style-type: none"> 1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. 3. Tolerance : includes set up tolerance, line regulation and load regulation. 4. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives. 5. Length of set up time is measured at first cold start. Turning ON/OFF the power supply may lead to increase of the set up time. 				

Case No.962A Unit:mm

Mechanical Specification



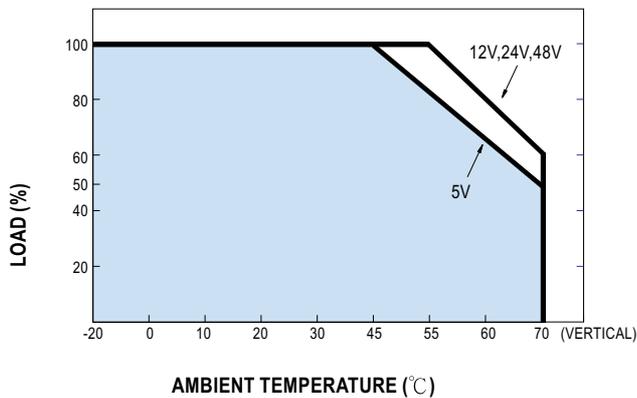
Block Diagram



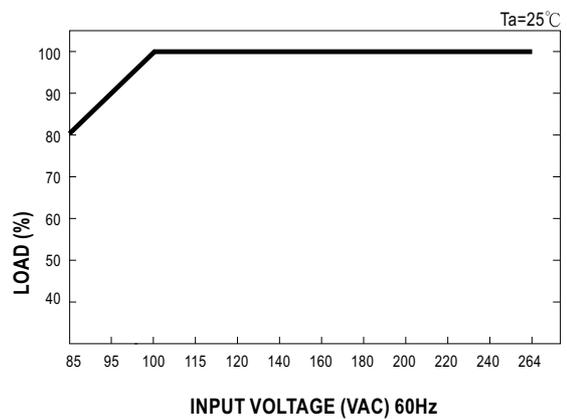
DC OK Relay Contact

Contact Close	PSU turns on / DC OK.
Contact Open	PSU turns off / DC Fail.
Contact Ratings (max.)	30V/1A resistive load.

Derating Curve



Output Derating VS Input Voltage



Multi 9 C60N UL 489 Listed 240 V Miniature Circuit Breakers

- UL 489 Listed and CSA 22.2 No.5.1 for branch circuit protection
- Eliminates concerns and uncertainty of using a UL 1077 device where a UL 489 device is required
- Replaces fuses in low-ampere range; 17 ratings up to 35 A

- 10 k AIR (1P @ 120 Vac; 2P and 3P @ 240 Vac)
- 60 Vdc for 1P and 125 Vdc for 2P (on C-curve circuit breakers only, see table below)
- Increased installation flexibility with standard box lugs or optional ring terminals
- Allows easy front-mounting and rear wiring when using ring terminals
- A wide range of electrical and mechanical accessories
- Suitable for reverse feeding
- Trip-free mechanism
- Positive indication of contact disconnect

Trip Curve	Use	Magnetic Release
C	For typical loads	7–10 x ampere rating (7–14 for DC)
D	For high inrush	10–14 x ampere rating

Table 7.27: UL 489 Circuit Breakers (120/240 V)

Rating (A)	C Curve—7–10 Times Ampere Rating (7–14 DC)						D Curve—10–14 Times Ampere Rating					
	1P▲		2P■		3P		1P		2P		3P	
	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
Box Lug/Box Lug												
0.5	60100	83.00	60134	179.00	—	—	60117	83.00	60151	179.00	—	—
1	60101	83.00	60135	179.00	60168	258.00	60118	83.00	60152	179.00	60184	258.00
1.5	60102	83.00	60136	179.00	60169	258.00	60119	83.00	60153	179.00	60185	258.00
2	60103	83.00	60137	179.00	60170	258.00	60120	83.00	60154	179.00	60186	258.00
3	60104	83.00	60138	179.00	60171	258.00	60121	83.00	60155	179.00	60187	258.00
4	60105	83.00	60139	179.00	60172	258.00	60122	83.00	60156	179.00	60188	258.00
5	60106	83.00	60140	179.00	60173	258.00	60123	83.00	60157	179.00	60189	258.00
6	60107	76.00	60141	164.00	60174	237.00	60124	76.00	60158	164.00	60190	237.00
7	60108	76.00	60142	164.00	60175	237.00	60125	76.00	60159	164.00	60191	237.00
8	60109	76.00	60143	164.00	60176	237.00	60126	76.00	60160	164.00	60192	237.00
10	60110	76.00	60144	164.00	60177	237.00	60127	76.00	60161	164.00	60193	237.00
13	60111	76.00	60145	164.00	60178	237.00	60128	76.00	60162	164.00	60194	237.00
15	60112	76.00	60146	164.00	60179	237.00	60129	76.00	60163	164.00	60195	237.00
20	60113	76.00	60147	164.00	60180	237.00	60130	76.00	60164	164.00	60196	237.00
25	60114	76.00	60148	164.00	60181	237.00	60131	76.00	60165	164.00	60197	237.00
30	60115	80.00	60149	171.00	60182	248.00	60132	80.00	60166	171.00	60198	248.00
35	60116	80.00	60150	171.00	60183	248.00	60133	80.00	60167	171.00	60199	248.00
Ring Tongue/Ring Tongue												
0.5	60200	87.00	60234	188.00	—	—	60217	87.00	60251	188.00	—	—
1	60201	87.00	60235	188.00	60268	273.00	60218	87.00	60252	188.00	60284	273.00
1.5	60202	87.00	60236	188.00	60269	273.00	60219	87.00	60253	188.00	60285	273.00
2	60203	87.00	60237	188.00	60270	273.00	60220	87.00	60254	188.00	60286	273.00
3	60204	87.00	60238	188.00	60271	273.00	60221	87.00	60255	188.00	60287	273.00
4	60205	87.00	60239	188.00	60272	273.00	60222	87.00	60256	188.00	60288	273.00
5	60206	87.00	60240	188.00	60273	273.00	60223	87.00	60257	188.00	60289	273.00
6	60207	81.00	60241	174.00	60274	252.00	60224	81.00	60258	174.00	60290	252.00
7	60208	81.00	60242	174.00	60275	252.00	60225	81.00	60259	174.00	60291	252.00
8	60209	81.00	60243	174.00	60276	252.00	60226	81.00	60260	174.00	60292	252.00
10	60210	81.00	60244	174.00	60277	252.00	60227	81.00	60261	174.00	60293	252.00
13	60211	81.00	60245	174.00	60278	252.00	60228	81.00	60262	174.00	60294	252.00
15	60212	81.00	60246	174.00	60279	252.00	60229	81.00	60263	174.00	60295	252.00
20	60213	81.00	60247	174.00	60280	252.00	60230	81.00	60264	174.00	60296	252.00
25	60214	81.00	60248	174.00	60281	252.00	60231	81.00	60265	174.00	60297	252.00
30	60215	84.00	60249	182.00	60282	263.00	60232	84.00	60266	182.00	60298	263.00
35	60216	84.00	60250	182.00	60283	263.00	60233	84.00	60267	182.00	60299	263.00
Box Lug/Ring Tongue												
0.5	60300	86.00	60334	186.00	—	—	60317	86.00	60351	186.00	—	—
1	60301	86.00	60335	186.00	60368	269.00	60318	86.00	60352	186.00	60384	269.00
1.5	60302	86.00	60336	186.00	60369	269.00	60319	86.00	60353	186.00	60385	269.00
2	60303	86.00	60337	186.00	60370	269.00	60320	86.00	60354	186.00	60386	269.00
3	60304	86.00	60338	186.00	60371	269.00	60321	86.00	60355	186.00	60387	269.00
4	60305	86.00	60339	186.00	60372	269.00	60322	86.00	60356	186.00	60388	269.00
5	60306	86.00	60340	186.00	60373	269.00	60323	86.00	60357	186.00	60389	269.00
6	60307	80.00	60341	171.00	60374	248.00	60324	80.00	60358	171.00	60390	248.00
7	60308	80.00	60342	171.00	60375	248.00	60325	80.00	60359	171.00	60391	248.00
8	60309	80.00	60343	171.00	60376	248.00	60326	80.00	60360	171.00	60392	248.00
10	60310	80.00	60344	171.00	60377	248.00	60327	80.00	60361	171.00	60393	248.00
13	60311	80.00	60345	171.00	60378	248.00	60328	80.00	60362	171.00	60394	248.00
15	60312	80.00	60346	171.00	60379	248.00	60329	80.00	60363	171.00	60395	248.00
20	60313	80.00	60347	171.00	60380	248.00	60330	80.00	60364	171.00	60396	248.00
25	60314	80.00	60348	171.00	60381	248.00	60331	80.00	60365	171.00	60397	248.00
30	60315	83.00	60349	179.00	60382	258.00	60332	83.00	60366	179.00	60398	258.00
35	60316	83.00	60350	179.00	60383	258.00	60333	83.00	60367	179.00	60399	258.00

- ▲ 1P dual rated 120 Vac/60 Vdc.
- 2P dual rated 240 Vac/125 Vdc.

Interrupting ratings Page 7-3
Accessories Page 7-20
Dimensions Page 7-53



1P C60N

2P C60N



3P C60N



Box Lug C60N



Ring Tongue C60N



Box/Ring C60N

7 MINIATURE AND MOLDED CASE CIRCUIT BREAKERS



1P
UL 1077 C60N

Multi 9 C60 UL 489 Listed 480V Miniature Circuit Breakers

- UL 489 Listed, CSA C22.2 No. 5.1; Also IEC 60947-2; CE marked
- 480Y/277 Vac @ 10 kA (2P and 3P), 277 Vac @ 10 kA (1P)
- 0.5 A through 20 A
- 1P, 2P, 3P, 18 mm wide per pole

- UL 486B Listed 2-barrel lug: 18–10 AWG (1-25 mm²) cables, Cu only
- Optional ring tongue terminals
- A wide range of electrical and mechanical accessories
- Suitable for reverse feeding
- Trip-free mechanism
- Positive indication of contact disconnect

Trip Curve	Use	Magnetic Release
C	For typical loads	7–10 x ampere rating (7–14 for DC)
D	For high inrush	10–14 x ampere rating

Table 7.28: UL 489 Circuit Breakers (480Y/277 Vac)

New!

Rating (A)	C Curve—7–10 Times Ampere Rating (7–14 DC)						D Curve—10–14 Times Ampere Rating					
	1P		2P		3P		1P		2P		3P	
	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price	Cat. No.	\$ Price
2-Barrel Wire Lug												
0.5	MGN61300	112.00	—	—	—	—	MGN61333	112.00	—	—	—	—
1	MGN61301	112.00	MGN61312	238.00	MGN61323	346.00	MGN61334	112.00	MGN61345	238.00	MGN61356	346.00
2	MGN61302	112.00	MGN61313	238.00	MGN61324	346.00	MGN61335	112.00	MGN61346	238.00	MGN61357	346.00
3	MGN61303	112.00	MGN61314	238.00	MGN61325	346.00	MGN61336	112.00	MGN61347	238.00	MGN61358	346.00
4	MGN61304	112.00	MGN61315	238.00	MGN61326	346.00	MGN61337	112.00	MGN61348	238.00	MGN61359	346.00
5	MGN61305	112.00	MGN61316	238.00	MGN61327	346.00	MGN61338	112.00	MGN61349	238.00	MGN61360	346.00
6	MGN61306	112.00	MGN61317	238.00	MGN61328	346.00	MGN61339	112.00	MGN61350	238.00	MGN61361	346.00
8	MGN61307	112.00	MGN61318	238.00	MGN61329	346.00	MGN61340	112.00	MGN61351	238.00	MGN61362	346.00
10	MGN61308	112.00	MGN61319	238.00	MGN61330	346.00	MGN61341	112.00	MGN61352	238.00	MGN61363	346.00
15	MGN61309	112.00	MGN61320	238.00	MGN61331	346.00	MGN61342	112.00	MGN61353	238.00	MGN61364	346.00
20	MGN61310	112.00	MGN61321	238.00	MGN61332	346.00	MGN61343	112.00	MGN61354	238.00	MGN61365	346.00
Ring Tongue Terminal												
0.5	MGN61366	112.00	—	—	—	—	MGN61399	112.00	—	—	—	—
1	MGN61367	112.00	MGN61378	238.00	MGN61389	346.00	MGN61400	112.00	MGN61411	238.00	MGN61422	346.00
2	MGN61368	112.00	MGN61379	238.00	MGN61390	346.00	MGN61401	112.00	MGN61412	238.00	MGN61423	346.00
3	MGN61369	112.00	MGN61380	238.00	MGN61391	346.00	MGN61402	112.00	MGN61413	238.00	MGN61424	346.00
4	MGN61370	112.00	MGN61381	238.00	MGN61392	346.00	MGN61403	112.00	MGN61414	238.00	MGN61425	346.00
5	MGN61371	112.00	MGN61382	238.00	MGN61393	346.00	MGN61404	112.00	MGN61415	238.00	MGN61426	346.00
6	MGN61372	112.00	MGN61383	238.00	MGN61394	346.00	MGN61405	112.00	MGN61416	238.00	MGN61427	346.00
8	MGN61373	112.00	MGN61384	238.00	MGN61395	346.00	MGN61406	112.00	MGN61417	238.00	MGN61428	346.00
10	MGN61374	112.00	MGN61385	238.00	MGN61396	346.00	MGN61407	112.00	MGN61418	238.00	MGN61429	346.00
15	MGN61375	112.00	MGN61386	238.00	MGN61397	346.00	MGN61408	112.00	MGN61419	238.00	MGN61430	346.00
20	MGN61376	112.00	MGN61387	238.00	MGN61398	346.00	MGN61409	112.00	MGN61420	238.00	MGN61431	346.00



2P
UL 1077 C60N



3P
UL 1077 C60N

Multi 9 C60N UL 489A Listed Miniature Circuit Breakers for DC Telecommunication Applications

A limited range of C60N products are UL Listed as UL 489A circuit breakers for protection of DC telecommunications circuits

Table 7.29: UL 489A Circuit Breakers for DC Telecommunications Applications (1P, 2 Modules, C curve)

Rating (A)	Cat. No.	\$Price	Rating (A)	Cat. No.	\$Price
0.5	60406	80.00	10	60414	67.00
1	60407	67.00	13	60415	67.00
2	60408	67.00	15	60416	67.00
3	60409	67.00	20	60417	67.00
4	60410	67.00	30	60418	67.00
5	60411	67.00	40	60419	74.00
6	60412	67.00	50	60420	78.00
8	60413	67.00	60	60421	82.00

Interrupting Rating..... Page 7-3
Accessories..... Page 7-20
Dimensions..... Page 7-53

7 MINIATURE AND MOLDED CASE CIRCUIT BREAKERS

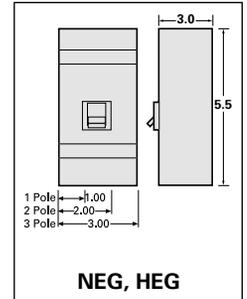
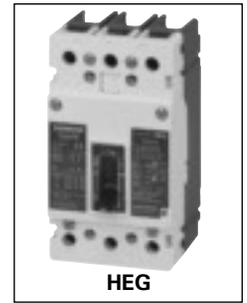
Molded Case Circuit Breakers

EG 125A Frame

Selection/Dimensions

Type NEG (Cable In - Cable Out)

Continuous Ampere Rating @ 40°C	1-Pole		2-Pole		3-Pole		4-Pole	
	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
15	NEG1B015L ^{①②}	297.00	NEG2B015L ^③	743.00	NEG3B015L ^④	930.00	NEG4B015L	1210.00
20	NEG1B020L ^{①②}	297.00	NEG2B020L ^③	743.00	NEG3B020L ^④	930.00	NEG4B020L	1210.00
25	NEG1B025L ^②	297.00	NEG2B025L ^③	743.00	NEG3B025L ^④	930.00	NEG4B025L	1210.00
30	NEG1B030L ^②	297.00	NEG2B030L ^③	743.00	NEG3B030L ^④	930.00	NEG4B030L	1210.00
35	NEG1B035L ^②	297.00	NEG2B035L ^③	743.00	NEG3B035L ^④	930.00	NEG4B035L	1210.00
40	NEG1B040L ^②	297.00	NEG2B040L ^③	743.00	NEG3B040L ^④	930.00	NEG4B040L	1210.00
45	NEG1B045L ^②	297.00	NEG2B045L	743.00	NEG3B045L	930.00	NEG4B045L	1210.00
50	NEG1B050L ^②	297.00	NEG2B050L ^③	743.00	NEG3B050L ^④	930.00	NEG4B050L	1210.00
60	NEG1B060L	297.00	NEG2B060L	743.00	NEG3B060L	930.00	NEG4B060L	1210.00
70	NEG1B070L	338.00	NEG2B070L	845.00	NEG3B070L	1056.00	NEG4B070L	1376.00
80	NEG1B080L	338.00	NEG2B080L	845.00	NEG3B080L	1056.00	NEG4B080L	1376.00
90	NEG1B090L	338.00	NEG2B090L	845.00	NEG3B090L	1056.00	NEG4B090L	1376.00
100	NEG1B100L	338.00	NEG2B100L	845.00	NEG3B100L	1056.00	NEG4B100L	1376.00
110	NEG1B110L	747.00	NEG2B110L	1864.00	NEG3B110L	2330.00	NEG4B110L	3029.00
125	NEG1B125L	747.00	NEG2B125L	1864.00	NEG3B125L	2330.00	NEG4B125L	3029.00



Type HEG (Cable In - Cable Out)

Continuous Ampere Rating @ 40°C	1-Pole		2-Pole		3-Pole		4-Pole	
	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$	Catalog Number	List Price \$
15	HEG1B015L ^{①②}	414.00	HEG2B015L ^③	966.00	HEG3B015L ^④	1133.00	HEG4B015L	1474.00
20	HEG1B020L ^{①②}	414.00	HEG2B020L ^③	966.00	HEG3B020L ^④	1133.00	HEG4B020L	1474.00
25	HEG1B025L ^②	414.00	HEG2B025L ^③	966.00	HEG3B025L ^④	1133.00	HEG4B025L	1474.00
30	HEG1B030L ^②	414.00	HEG2B030L ^③	966.00	HEG3B030L ^④	1133.00	HEG4B030L	1474.00
35	HEG1B035L ^②	414.00	HEG2B035L ^③	966.00	HEG3B035L ^④	1133.00	HEG4B035L	1474.00
40	HEG1B040L ^②	414.00	HEG2B040L ^③	966.00	HEG3B040L ^④	1133.00	HEG4B040L	1474.00
45	HEG1B045L ^②	414.00	HEG2B045L	966.00	HEG3B045L	1133.00	HEG4B045L	1474.00
50	HEG1B050L ^②	414.00	HEG2B050L ^③	966.00	HEG3B050L ^④	1133.00	HEG4B050L	1474.00
60	HEG1B060L	414.00	HEG2B060L	966.00	HEG3B060L	1133.00	HEG4B060L	1474.00
70	HEG1B070L	492.00	HEG2B070L	1098.00	HEG3B070L	1260.00	HEG4B070L	1638.00
80	HEG1B080L	492.00	HEG2B080L	1098.00	HEG3B080L	1260.00	HEG4B080L	1638.00
90	HEG1B090L	492.00	HEG2B090L	1098.00	HEG3B090L	1260.00	HEG4B090L	1638.00
100	HEG1B100L	492.00	HEG2B100L	1098.00	HEG3B100L	1260.00	HEG4B100L	1638.00
110	HEG1B110L	1031.00	HEG2B110L	2136.00	HEG3B110L	2561.00	HEG4B110L	3330.00
125	HEG1B125L	1031.00	HEG2B125L	2136.00	HEG3B125L	2561.00	HEG4B125L	3330.00

Line and load lugs are included as standard.
HACR rated.
Suitable for screw mounting.

Lugs For 60/75°C Wire

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight lbs. (kg)
1	1	1.1 (0.5)
2	1	2.0 (0.9)
3	1	3.1 (1.4)
4	1	3.9 (1.8)

NEG/HEG			
Ampere Rating	Wire Size	Catalog Number	List Price \$
15-125A	#14 - 3/0 AWG Cu (steel lugs)	3TW1EG30 (qty. 3)	12.80
15-125A ^①	#14 - 1/0 AWG Cu #14 - 1/0 AWG Al	3TA1EG10 (qty. 3)	12.80
15-125A ^②	#6 - 3/0 AWG Cu #6 - 3/0 AWG Al	3TA1EG30 (qty. 3)	12.80
15-125A	Nut Keeper plate w/ screw (for crimp terminals)	TNKE3 (3-Pole) TNKE4 (4-Pole)	12.30 15.60

Interrupting Ratings

Breaker Type	Number of Poles	UL 489 AIR					IEC 60947-2							
		RMS Symmetrical Amperes (KA)					Volts AC (50/60Hz)							
		Volts AC(50/60Hz)					Volts DC		220/240		380/415		Volts DC	
NEG	1	85	35	22	—	—	35	—	85	43	—	—	35	—
	2, 3, 4	85	—	—	35	22 ^③	—	35	85	43	40	20	—	35
HEG	1	100	65	25	—	—	42	—	100	50	—	—	42	—
	2, 3, 4	100	—	—	65	25 ^③	—	42	100	50	70	35	—	42

For inches / millimeters conversion, see Application Data section.

① SWD rated.
② HID rated 277 VAC.

③ Applies to 3 & 4-pole breakers only.
④ Optional lugs for NEG and HEG breakers.

Accessories pages 6-33 and 6-86 to 6-91

Molded Case Circuit Breakers

Internal Accessories for NEG and HEG 125A Frame

Selection

Shunt Trip

Control Voltage		NEG, HEG Catalog Number	List Price \$
V AC	V DC		
110-240	125	STRER240	636.00
380-600	—	STREV600	636.00
24-60	24-60	STREM60D	636.00

Auxiliary Switch

Maximum Voltage		Number of Contacts	NEG, HEG Catalog Number	List Price \$
AC	DC			
240	125	1A-1B	ASKE2	271.00
240	125	2A-2B	ASKE3	540.00

Alarm Switch

Maximum Voltage		Number of Contacts	NEG, HEG Catalog Number	List Price \$
AC	DC			
240	125	1A-1B	ASKE1	271.00
240	125	2A-2B	ASKE5	540.00

Undervoltage Trip

Control Voltage		NEG, HEG Catalog Number	List Price \$
AC	DC		
24		UVREB24A	636.00
60		UVREM60▲	636.00
120		UVREN120	636.00
240		UVRER240	636.00
480		UVREU480▲	636.00
600		UVREV600▲	636.00
	24	UVREB24D	636.00
	48	UVREC48D▲	636.00
	125	UVRED125D▲	636.00
	250	UVREE250D▲	636.00

Alarm and Auxiliary Switch Combinations

For Breaker	Catalog Number	List Price \$
NEG, HEG	ASKE6	540.00

▲ Built to order. Allow 6-8 weeks for delivery.

SDSA3650 SPDs

Square D Type 1 Surge Protective Devices

Square D™ brand Surgelogic™ SDSA3650 products are compact and affordable Surge Protective Devices (SPDs). SDSA3650 SPDs offer a simple means to bring down initial surges to manageable levels and can offer additional value in a cascaded SPD system. Their compact design allows surge suppression to be installed adjacent to power panels or directly on sensitive equipment.



SDSA3650 SPDs Features

Superior Performance

Square D brand SurgeLogic SDSA3650 SPDs utilize high-energy suppression circuitry that can be located at any point in the electrical system. As a Type 1 rated device, they have the flexibility to be used with or without an Overcurrent Protection Device (OCPD).

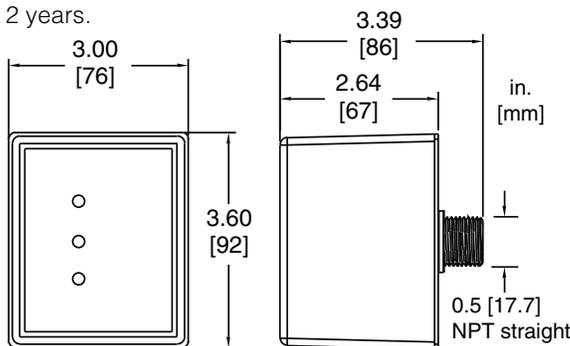
SDSA3650 SPDs provide surge suppression for equipment from severe transient activity. Each metal oxide varistor (MOV) is individually fused and the products carry a NEMA Type 4X rating suitable for installing indoors, outdoors, or in other harsh environments.

Easy Installation

SurgeLogic SDSA3650 SPDs are some of the most versatile, yet compact devices available on the market today. This compact package can be mounted on an electrical panel, meter socket, or inside electrical control cabinets.

Warranty

The SDSA3650 and SDSA3650D warranty is 2 years.



SDSA3650 SPDs



Performance

Surge Current Rating per Phase	40kA	
Short Circuit Current Rating	200kA	
Modes of Protection	6	
Fusing Individually fused MOVs		
Thermal Fusing	Yes	
Overcurrent Fusing	Yes	
Operating Frequency	50/60	Hz

Mechanical Description

Enclosure	Plastic	
NEMA Rating	NEMA T	type 4X
Connection Method	#12 WG	A
Weight	1.8 lbs	
Mounting Method	Close Nipped, Back Mounted	
Operating Altitude	Sea Level-12,000' (3,658 m)	
Storage Temperature	-40° F to +149° F	
	(-40° C to +65° C)	
Operating Temperature	-40° F to +149° F	
	(-40° C to +65° C)	

Diagnostics

Green status LED

Listings and Performance

cULus Listed per UL 1449 3rd edition Type 1 SPD, UL 1283, CSA C22.2 No. 8-M1986, C233.1-87 CE marked (IEC 61643-11)

The SDSA3650 is a four-wire surge suppressor designed for use on all solidly grounded systems up to 600Y/347 Vac. The SDSA3650D is a three-wire surge suppressor designed for delta applications up to 600 Vac.

Voltage	Surge Current per Phase	Modes of Protection	Configuration	Model Number	MCO	VSCCR	I _n	VPR				
								L-NL	-GL	-LN-G ¹		
600Y/347V ¹	40kA ₆	3	∅, 4-wire	SDSA3650	750V	L-N 1500V	L-L 200kA	10kA	2500V	N/A	4000V	N/A
600V Delta ²	40kA ₃	3 ₃	3 ∅, 3-wire	SDS SDSA3650D	1500V	1500V L-L	200kA	10kA	N/A	N/A	N/A	4000V

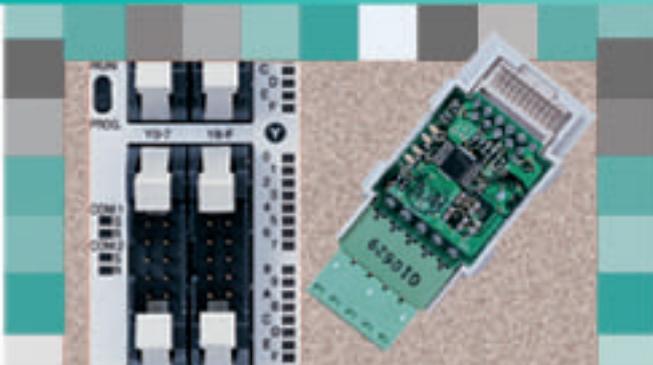
1 Applicable voltages: 120/240V, 208Y/120V, 380Y/220V, 400Y/230V, 480Y/277V, 600Y/347V

2 Applicable voltages: 240V Delta, 480V Delta, 600V Delta

Square D and SurgeLogic are trademarks or registered trademarks of Schneider Electric and/or its affiliates in the United States and/or other countries. Other marks used herein may be the property of their respective owners.



*New:
32k Instructions*



FPΣ (Sigma) Programmable Controller

FPΣ (Sigma)

Specification tables

PERFORMANCE SPECIFICATIONS			
Item	Description		
Type of control unit	NPN transistor output type	PNP transistor output type	Relay output type
Part number	FPG-C32T2H/FPG-C32T2HTM	FPG-C28P2H/FPG-C28P2HTM	FPG-C24R2H/FPG-C24R2HTM
Number of I/O points			
No expansion	32 (Input: 16 / Output: 16)	28 (Input: 16 / Output: 12)	24 (Input: 16 / Output: 8)
with expansion	Max. 384	Max. 380	Max. 376
Program memory	Built-in Flash ROM		
Program capacity	32,000 steps		
Operation speed	0.32 μs- /step, Basic instructions		
Memory for execution			
External input (X)	1184 points		
External output (Y)	1184 points		
Internal relay (R)	4096 points (R0 to R255F)		
Timer/Counter (T/C)	1024 points ^{1, 2} / At reset: timer 1008 points (T0-T1007), counter 16 points (C1008-C1023), Timer range is selected by instructions from 1ms, 10ms, 100ms, 1s / Counter: 1 to 32767 counts		
Link relay (L)	2048 points ¹		
Data register (DT)	32765 words (DT0-DT32764) ¹		
Link data register (LD)	256 words ¹		
Index register (I)	14 words (I0-ID)		
Differential points	Unlimited number of points		
Master control relay points	256 points		
Labels (JP+LOOP)	256 labels		
Number of step ladder	1000 stages		
Number of subroutine	100 subroutines		
High-speed counter	Single-phase: 1ch: 50kHz/2ch: 30kHz/3 or 4ch: 20 kHz / Two-phase: 1ch: 20kHz/2ch: 15kHz		
Pulse output	1 channel: 100kHz / 2 channel: 60kHz		
PWM output	2 channels, 1.5 to 12.5 kHz (at resolution of 1000) / 15.6 to 41.7 kHz (at resolution of 100)		
Pulse catch input	8 points (X0-X7)		
Interrupt program	9 programs (external 8 points, 1 periodical interrupt point 0.5ms - 30s)		
Self-diagnosis functions	Watchdog timer, program syntax checking, etc.		
Clock/Calendar function	Year, month, day, hour, minute, second, and day of week ⁶		
Volume input	2 points resolving power 10bits (K0-K1000)		
Thermistor input	2 points, resolution: 10 bits (0 to 1000) (for C32T2HTM, C24R2HTM, and C28P2HTM only)		
Link functions	Computer link (1:1, 1:N) ^{3, 4} General communication (1:1, 1:N) ^{3, 4} PLC link ⁵		
Battery life (Battery is optional)	220 days or more* (actual usage value: approx. 840 days (25°C). Suggested replacement interval: 1 year		
Comment storage	All kinds of comments, including I/O comments, remarks and block comments, can be stored (without backup battery)		
Linear/circular interpolation for positioning	Available	Available	Not available
Other functions	Program edition during run, constant scan, forced I/O, password, floating point real number operation, PID processing instruction Comment memory 128Kbyte		

Notes: 1) If a battery is not used, only fixed area is backed up (Counter: C1008-C1023, internal relay: R900-R97F, Data register: DT32710-DT32764). If a battery is used, backup is possible: Area-setting of hold or no-hold is possible by system register.

2) Points can be increased using auxiliary timer.

3) Optional communication cassette (RS232C type) is necessary for 1:1 communication.

4) Optional communication cassette (RS485 type) is necessary for 1:N communication.

5) Optional communication cassette (RS485 type) is necessary.

6) Optional battery is necessary in order to use Clock/Calendar function. Precision calendar timer: at 25°C = 77°F less than 51-second error per month / at 0°C = 32°F less than 119-second error per month / at 55°C = 131°F less than 148-second error per month.

*Value applies when no power is supplied at all.

FPΣ (Sigma)

Specification tables

INPUT SPECIFICATIONS	
Insulation method	Optical coupler
Rated input voltage	24VDC
Input voltage range	21.6 to 26.4VDC
Rated input current	3.5mA - 8mA depends on input no.
Input points per common	8 points/common (FPG-C24), 16 points/common (FPG-C32/C28), 32 points/common (FPG-XY64). Either the positive or negative of input power supply can be connected to terminal
Min. ON voltage / Max. OFF current	19.2V / 3mA - 6mA depends on input no.
Max. ON voltage / Min. OFF current	2.4V / 1.3mA
Input impedance	3k - 6.8k depends on input no.
Response time	CPU: 1ms or less, 5μs (HSC, pulse catch, interrupt input)
Expansion:	0.2ms (OFF -> ON) 0.3ms (ON -> OFF)
Operating indicator	LED

OUTPUT SPECIFICATIONS - TRANSISTOR OUTPUT TYPE		
Item	FPG-C32 (NPN)	FPG-C28 (PNP)
Insulation method	Optical coupler	
Output method	Open collector	
Rated voltage range	5 to 24VDC	24VDC
Operating load voltage range	4.75 to 26.4VDC	21.6 to 26.4VDC
Max. load current	For Y0, Y1, Y3, Y4: 0.3A For Y2, Y5 to YF: 0.1A	For Y0, Y1, Y3, Y4: 0.5A For Y2, Y5 to YB: 0.3A
Max. surge current	For Y0, Y1, Y3, Y4: 0.9A For Y2, Y5 to YF: 0.5A	For Y0, Y1, Y3, Y4: 1.5A For Y2, Y5 to YB: 0.7A
Output points per common	16 points/common	12 points/common
Response time	OFF -> ON For Y0, Y1, Y3, Y4 at 15mA or less: <2μs For Y2, Y5 and higher: < 0.2ms	
	ON -> OFF For Y0, Y1, Y3, Y4 at 15mA or less: <8μs For Y2, Y5 and higher: < 0.5ms	
Power supply for driving internal circuit	none	
Operating indicator	LED	
Phase fault protection	Thermal protection for Y2, Y5 and higher	

OUTPUT SPECIFICATIONS - RELAY OUTPUT TYPE	
Output type	Normally open (1 Form A)
Rated control capacity	2A 250VAC, 2A 30VDC (max. 4.5A/common)(resistive load)
Output points per common	8 points/ common
Response time	OFF -> ON: 10ms or less ON -> OFF: 8ms or less
Mechanical life time	20 million operations or more
Electrical life time	100.000 operations or more
Surge absorber	21.6 to 26.4VDC (70mA)
Operating indicator	LED

GENERAL SPECIFICATIONS	
Rated operating voltage	24VDC
Operating voltage range	21.6 to 26.4VDC
Allowable no voltage time	4ms (at 21.6V), 10ms (at 26.4V)
Ambient temperature	0°C to +55°C
Storage temperature	-20°C to +70°C
Ambient humidity	30 to 85% RH (Non-condensing)
Storage humidity	30 to 85% RH (Non-condensing)
Vibration resistance	10 to 55Hz, 1 cycle/min., double amplitude of 0.75mm, 10min. on 3 axes

Shock resistance	98m/s ² or more, 4 times on 3 axes
Noise immunity	1,000V (p-p) with pulse widths 50ns and 1μs
Operating condition	free from corrosive gasses and excessive dust

Human/Machine Interfaces

Magelis™ GTO Advanced Optimum panels

Catalog

November 2013



Operator dialogue terminals

Magelis™ GTO Optimum Advanced panels

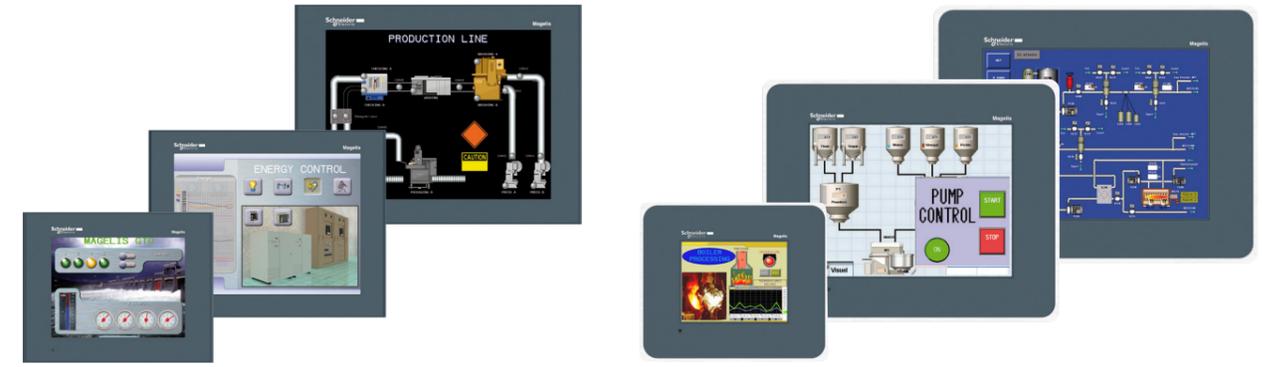
Applications	Display of text messages, graphic objects and synoptic views Control and configuration of data
Type of terminal	Optimum Advanced panels, touch screen
Degree of protection (according to IEC 60529)	IP 65 (IP 67 with addition of a cover)



Display	Type	Color TFT LCD, backlit 320 x 240 pixels (QVGA)	Color TFT LCD, backlit 800 x 480 pixels (WVGA)	
	Capacity	3.5"	5.7"	7.0" Wide
Data entry	Static function keys	Via touch screen	Via touch screen	Via touch screen
	Dynamic function keys	6 function keys (static or dynamic)	–	8 function keys (static or dynamic)
	Service keys	–	–	–
	Alphanumeric keys	–	–	–
	Applications	64/96 MB Flash EPROM (1)	96 MB Flash EPROM	
Functions	Expansion	–	By 4 GB SD card (except HMIGTO2300)	
	Maximum number of pages	Limited by internal Flash EPROM memory capacity	Limited by capacity of internal Flash EPROM memory or of SD card	
	Variables per page	Unlimited (8000 variables max.)		
	Representation of variables	Alphanumeric, bitmap, bargraph, gauge, tank, tank level indicator, curves, polygon, button, LED		
	Recipes	32 groups of 64 recipes comprising 1024 ingredients max.		
	Curves	Yes, with log		
	Alarm logs	Yes		
	Real-time clock	Built-in		
	Discrete I/O	–		
	Multimedia I/O	–		
Communication	Downloadable protocols	Uni-TE (2), Modbus, Modbus TCP/IP (1) and for PLC brands: Mitsubishi, Omron, Allen-Bradley and Siemens		
	Asynchronous serial link	RS 232C (COM1) and RS 485 (COM2) except HMIGTO1310: RS 232C/485 (COM1)		
	USB ports	1 type A host connector + 1 mini-B connector		
	Buses and networks	Ethernet TCP/IP (10BASE-T/100BASE-TX) (3), Modbus Plus and Fipway via USB gateway		
	Printer link	RS 232C (COM1) serial link (4) and USB port for parallel printer		
Development software	Vijeo Designer (on Windows XP and Windows 7) (5)			
Operating system	Magelis (333 MHz RISC CPU)			
Type of terminal	HMIGTO1300 HMIGTO1310	HMIGTO2300 HMIGTO2310	HMIGTO3510	
Page	2/11			

(1) Depending on model.
 (2) Uni-TE version V2 for Twido controller and TSX Micro/Premium platform.
 (3) Except HMIGTO1300 and GTO2300 (Modbus Plus and Fipway via USB gateway only).
 (4) Except HMIGTO1310 (USB port for parallel printer only).
 (5) For more information, please refer to our website www.schneider-electric.com.

Applications	Display of text messages, graphic objects and synoptic views Control and configuration of data
Type of terminal	Optimum Advanced panels, touch screen
Degree of protection (according to IEC 60529)	IP 65 (IP 67 with addition of a cover)
Applications	Display of text messages, graphic objects and synoptic views Control and configuration of data
Type of terminal	Optimum Advanced panels, touch screen, "Stainless Steel" version
Degree of protection (according to IEC 60529)	IP 66K (Front panel with Stainless Steel frame) for food & beverage environment

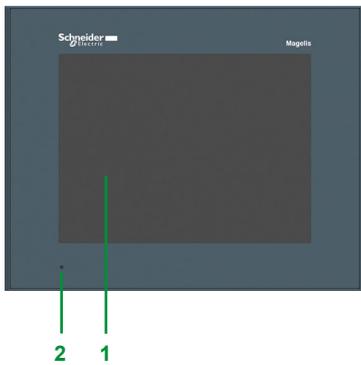
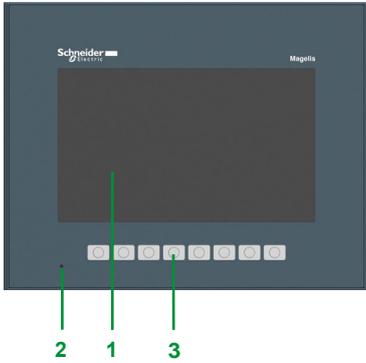


Display	Type	Color TFT LCD, backlit 640 x 480 pixels (VGA)	Color TFT LCD, backlit 640 x 480 pixels (VGA)	Color TFT LCD, backlit 800 x 600 pixels (SVGA)	Color TFT LCD, backlit 320 x 240 pixels (QVGA)	Color TFT LCD, backlit 640 x 480 pixels (VGA)	Color TFT LCD, backlit 800 x 600 pixels (SVGA)
	Capacity	7.5"	10.4"	12.1"	5.7"	10.4"	12.1"
Data entry	Static function keys	Via touch screen					
	Dynamic function keys	–					
	Service keys	–					
	Alphanumeric keys	–					
	Applications	96 MB Flash EPROM By 4 GB SD card					
Functions	Expansion	By 4 GB SD card (except HMIGTO2300)					
	Maximum number of pages	Limited by capacity of internal Flash EPROM memory or of SD card					
	Variables per page	Unlimited (8000 variables max.)					
	Representation of variables	Alphanumeric, bitmap, bargraph, gauge, tank, tank level indicator, curves, polygon, button, LED					
	Recipes	32 groups of 64 recipes comprising 1024 ingredients max.					
	Curves	Yes, with log					
	Alarm logs	Yes					
	Real-time clock	Built-in					
	Discrete I/O	–					
	Multimedia I/O	–					
Communication	Downloadable protocols	Uni-TE (2), Modbus, Modbus TCP/IP (1) and for PLC brands: Mitsubishi, Omron, Allen-Bradley and Siemens					
	Asynchronous serial link	RS 232C (COM1) and RS 485 (COM2)					
	USB ports	1 type A host connector + 1 mini-B connector					
	Buses and networks	Ethernet TCP/IP (10BASE-T/100BASE-TX), Modbus Plus and Fipway via USB gateway					
	Printer link	RS 232C (COM1) serial link and USB port for parallel printer					
Development software	Vijeo Designer (on Windows XP and Windows 7) (5)						
Operating system	Magelis (333 MHz RISC CPU)						
Type of terminal	HMIGTO4310	HMIGTO5310	HMIGTO6310	HMIGTO2315	HMIGTO5315	HMIGTO6315	
Page	2/11						

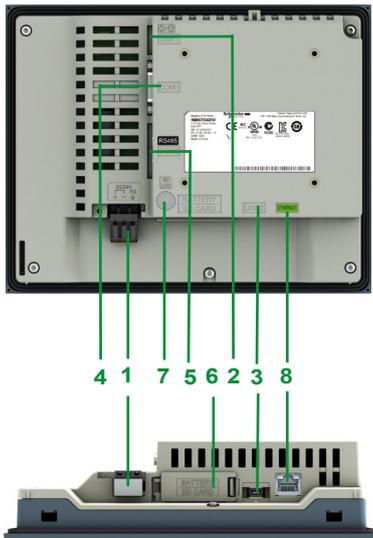
(1) Depending on model.
 (2) Uni-TE version V2 for Twido controller and TSX Micro/Premium platform.
 (3) Except HMIGTO1300 and GTO2300 (Modbus Plus and Fipway via USB gateway only).
 (4) Except HMIGTO1310 (USB port for parallel printer only).
 (5) For more information, please refer to our website www.schneider-electric.com.

2

Front



Rear



Underside

Description

Magelis Advanced panels HMIGTO3510/4310

The HMIGTO3510 panel has the following features on the front:

- 1 A touch screen for displaying synoptic views (7.0" Wide color TFT)
- 2 A multicolor indicator (green, orange and red) showing the panel's operating mode.
- 3 Eight function keys (F1, F2, F3, F4, F5, F6, F7 and F8).

The HMIGTO4310 panel has the following features on the front:

- 1 A touch screen for displaying synoptic views (7.5" color TFT)
- 2 A multicolor indicator (green, orange and red) showing the panel's operating mode.

Both terminals have the following features on the rear and underside:

- 1 A removable screw terminal block for 24 V $\bar{\text{---}}$ power supply.
- 2 A type A USB host connector for connecting peripherals, transferring applications and Modicon M340 terminal port communication.
- 3 A mini-B USB connector for application transfer.
- 4 A 9-way male SUB-D connector for RS 232C serial link to PLCs (COM1).
- 5 An RJ45 connector for RS 485 serial link (COM2).
- 6 A slot for SD memory card, with hinged cover.
- 7 LED indicating presence of the SD memory card.
- 8 An RJ45 connector for Ethernet TCP/IP link, 10BASE-T/100BASE-TX with an activity LED.

Altivar® 61

Variable speed AC drives
Power over the *elements!*



For 3-phase asynchronous motors from 1 to 900 HP.





Altivar® 61 Drives

Manage and *monitor* your building

The Altivar® 61 drive defines **ease of use** for variable speed drives used in centrifugal pump and fan applications offering the **highest level of features, functions and flexibility**. Its evolutionary design will **reduce installation** and **start-up time** while offering **reliable operation, simple diagnostics** and **energy efficiency**.

The Altivar 61 drive enables you to:

- Reduce **energy costs** by reducing motor speed
- Reduce **installation costs** by eliminating throttling valves or inlet guide vanes typically used to control flow, offering internal connection to major building networks and with quick and simple installation
- Improve **up-time** by providing superior **voltage dip ride through**
- Reduce **life cycle costs** of the installation by eliminating mechanical shock to belts and motors
- Improve indoor **air quality** and **occupant comfort** through accurate flow control



Supply fans for heating and air conditioning:

- Adjustment of flow rates on the basis of actual need
- Enhance comfort by reducing noise pollution caused by the motor with unique random switching frequency modulation
- Detection of broken fan belt
- Automatic restart after most faults



Ventilation fans exhaust/smoke extraction

- Forced start function with fault inhibition and fireman's override
- For high inertia applications, braking possible using resistors
- Run permissive damper input
- Catch on the fly by speed search regardless of the direction of rotation to start wind milling fans



Cooling tower fans

- Suppression of mechanical resonance using skip/jump frequencies
- Loss of follower with alarm management
- External fault input
- Adjustments to eliminate gear box backlash and cogging



Multipump: water distribution

- With the multipump option card, the **Altivar 61 drive** provides **flexibility, user-friendliness and adaptability** for the management of multiple pump installations
- The multipump option card contains a variety of pre-programmed function and features to manage multipump installations, such as **monitor and fully control the installation** by switching and managing the wear and tear between pumps



Municipal water pumps

- **Safety and protection of pump:** Detection of current threshold
- Limitation of operating time at low speed
- PTC probe management
- Auto-restart function with configurable response
- Underload and overload detection



Hot water and chilled water pumps

- Underload and overload detection with alarm
- Low flow detection
- Sleep/wake function
- Power used, power on time, motor run time

The Altivar 61 drive offers the following values:

- For **OEMs**, it offers **customizable** capability that allows the OEM to add value and provide a **unique** solution.
- For **System Integrators**, it offers **flexibility, functionality** and wide product range to adapt to a wide variety of job requirements
- For **End User** installations, it offers **quick** installation, **simple** start-up, and on-board diagnostics for **uncomplicated** maintenance.

Altivar® 61 Drives

The *leading edge!*

This new generation of AC drives demonstrates the expertise and know-how of Schneider Electric with respect to AC drives. Exceptional flexibility, advanced functions and a high level of customization...while always keeping the emphasis on *simplicity*. Open to many communication networks, the Altivar 61 drive provides *ingenious solutions* for all your HVAC fan and pump requirements.

A *powerful* fleet

- 1 to 900 HP
3-phase 380 to 480V
- 1 to 125 HP
3-phase 200 to 240V
- Integrated EMC level A filters
- Worldwide offer:
UL, CSA, CE, C-Tick, GOST,
UL1995 Plenum rated, SEMI-F47

Remarkable performance for fan and pump applications

- Under voltage ride-thru qualified to SEMI-F47 standard
- Catch on the fly restart
- Up to **110% overcurrent**
- Energy economizer motor algorithm to maximize energy savings, or select two point or five point Volts/Hz profile
- Three skip frequency bands
- Bump-less transfer from automatic to hand control

Expandable capabilities

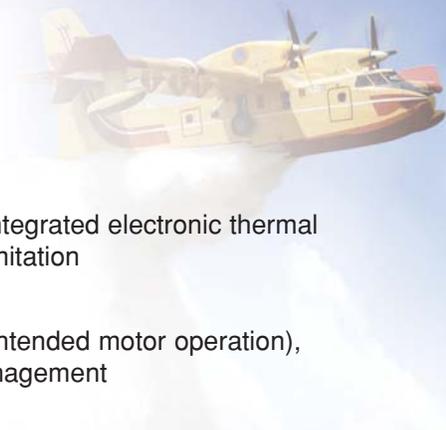
The drive is equipped with a wealth of features, application functions, inputs/outputs and communication capabilities. These can be further extended by:

- input/output extension cards
- communication cards
- a Controller Inside programmable card
- a Multipump application card



Simply Smart!

Leverage **ingenuity**
and intelligence
for **ease** of use



Protection at all levels

- **Of the Motor:**
Thermal protection by PTC probe or integrated electronic thermal overload, voltage and current surge limitation
- **Of the Machine:**
Power removal safety function (no unintended motor operation), alarm management, external fault management
- **Of the Drive:**
Protection in the event of overheating, current limitation using hardware and software, protection against corrosive environments
- **Of the Installation:**
The intelligent design of the Altivar 61 drive power system architecture optimizes the balance between inductance and capacitance to achieve effective harmonic mitigation with 3% equivalent impedance without requiring additional panel space. This unique design minimizes dc bus ripple, reduces input currents and lowers harmonic currents. This eliminates the need to oversize power wiring, disconnect means, and short circuit protection devices. This also improves the efficiency of the drive and allows operation at higher ambient temperature than other AC drives.
- **Of the Environment:**
Developed in accordance with the Eco-Design principle. Materials used have been selected for their minimal impact on the environment and conform to the RoHS directive (Restriction of Hazardous Substances) that prohibits certain levels of materials. Also, 88% of the parts used for the Altivar 61 drive are recyclable, conforming to the directive WEEE (Waste Electrical & Electronic Equipment).



Easy to control...

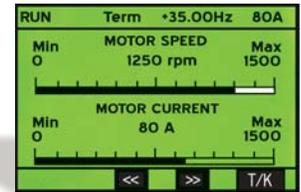
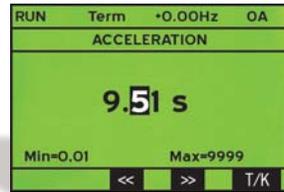
- Graphic screen with customizable display
- Plain text with six languages (English, Chinese, German, Spanish, French and Italian)
- Navigation wheel for easily “surfing” through the menus
- “Simply Start” menu for quick start-up and immediate benefit of the full performance of the Altivar 61 drive
- Function keys for short-cuts, on-line help or configurable for some applications
- Continuous display of the operating parameters of the motor
- Hand/auto function key provides one button bumpless transfer between terminal strip control and control with the keypad, or between communication network control and control with the keypad



Altivar® 61 Drives

Message received: *all clear...*

The Altivar 61 drive is a professional at communication: its messages are clear, precise, illustrated and intuitive to use.



Flexibility

with its remote mounting alternatives:

- on the door of an enclosure, with an IP54 or IP65 degree of protection
- for multipoint connection to several drives

Stores four configurations for transfer to other drives.

Protection

Multi level password protected, for allowing access to parameters or configurations with complete security.

Refine

select filtering and scaling values to analog inputs and analog outputs

Ergonomic

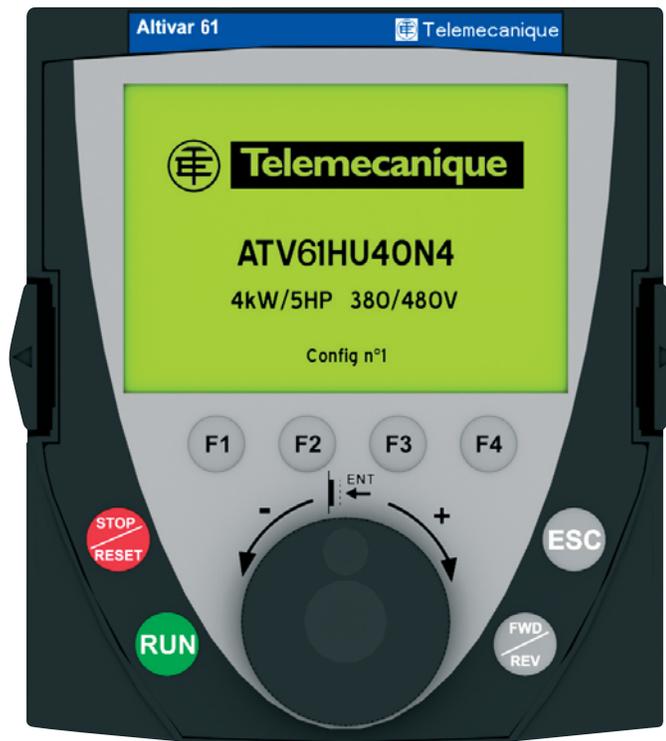
with its navigation button. With just one finger, freely and quickly "surf" the drop-down menu.

Clarity

of the display comprising eight lines of text and graphics. Legibility from 16 ft. Six languages available: English, Chinese, German, French, Spanish and Italian.

Simplicity

using function keys for short-cuts, direct access and on-line help, display of the minimum and maximum values of the parameters.



Customization

of parameters, display screens, on-line monitoring, creation of "user" menu.

Adaptability

add timing delays to logic inputs, logic outputs and relay output.

Modify

configure the active state on the relay and logic outputs.

Configure for your application

- Integrated **macro-configurations** are designed for a wide variety of applications and uses: pump and fan, connection to communication networks and PID regulation. They can easily be customized
- The architecture of the menus, hierarchical parameter system and short-cut functions enable **simple and quick programming**, even for the most sophisticated functions

RUN	Term	+60.00Hz	5.4A
1.1-SIMPLY START			
2/3 wire control	:	2 wire	
Macro-configuration	:	Pumps, Fans	
Standard mot. freq.	:	60Hz NEMA	
Rated motor power	:	10HP	
Rated motor volt.	:	460V	
Code	<<	>>	406V

The "Simply Start" menu provides easy access to the most common parameters to reduce start-up time of the Altivar 61 drive.

RDY	Term	+0.00Hz	0.0A
1.DRIVE MENU			
1.1 SIMPLY START			
1.2. MONITORING			
1.3. SETTINGS			
1.4. MOTOR CONTROL			
1.5. INPUTS / OUTPUTS CFG			
Code	<<	>>	T/K

RDY	Term	+0.00Hz	0.0A
QUICK NAVIGATION			
RETURN TO MAIN MENU			
DIRECT ACCESS TO...			
10 LAST MODIFICATIONS			
Code	<<	>>	T/K

More on-board *diagnostics*

Ample diagnostics available via the graphic terminal **simplify setting-up** and **maintaining** your equipment.

The state of the drive is recorded at moment of a fault to assist with diagnostics

- Elapsed time
- Line voltage
- Motor current
- and more...



With PowerSuite™ software workshop you **stay in control, even from a distance!**

For configuring, adjusting and monitoring your Altivar drive...keep an eye on your installations via Bluetooth®...

Oscilloscope function incorporated in the Altivar 61 drive: display multiple channels using PowerSuite.

RUN	Mod.	+50.00Hz	5.4A
COMMUNICATION MAP			
Cmd channel	:	Modbus	
Cmd value	:	ABCD Hex	
Active ref. ch	:	RUN	
Frequency re	:	+50.00Hz	
ETA status w	:	5.4A	
Code	<<	>>	T/K

LOGIC INPUT MAP						
PR	LI1	LI2	LI3	LI4	LI5	LI6
<input type="checkbox"/>						
LI7	LI8	LI9	LI10			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
MOT LI: 010101010101B						
			<<	>>	T/K	

Display of inputs/outputs, communication, etc.

RDY	Term	+0.00Hz	0.0A
TEST IGBT			
IGBT 1		OK	
IGBT 2		Open	
IGBT 3		OK	
Code	<<	>>	T/K

Test functions for drive, motor, components, inputs/outputs, etc.

RUN	Term	+50.00Hz	5.4A
SERVICE MESSAGE			
For technical support, dial 123-45			
Code	<<	>>	T/K

Service messages of all types of information on the display: a telephone number, a specific instruction... stored in the drive.

RUN	Term	+50.00Hz	5.4A
1.11 IDENTIFICATION			
ATV61HU22N4			
2.2kW/ 3HP			
380 / 480 V			
Appl. Software V1.0 IE 01			
MC Software V1.0 IE 01			
Code	<<	>>	T/K

Identity incorporated in the drive simplifies **installed base management.**

Altivar® 61 Drives

Evolutionary design

Unrivalled basic equipment

With the many functions already integrated in the Altivar 61 drive, you **reduce the cost of solutions** for your installation. The most economical solution is offered without compromise!

Interface with the typical HVAC and Pump I/O requirements such as:

- run command: Input to VFD by remote dry contact from the BAS
- speed command: Input to VFD from the BAS
- run status: Output contact from VFD to the BAS
- speed feedback: Analog output from VFD to the BAS
- fault output: Form-C contact from VFD to the BAS
- fire/safety interlock: 24Vdc supplied by VFD, Use N.C. contacts

Fans optimized for long life and serviceability

The cooling fans on the Altivar 61 drive are designed to be easily removed for cleaning and servicing. These fans can be removed without removing the drive from the wall or its enclosure and are intelligently cycled on only when required to cool the drive, maximizing the life of the fan.

With more than 100 fan and pump functions available, you benefit from:

- increased flexibility
- high level of customization
- high level of integration

Integrated Modbus® and CANopen Port

With these two standard networks, you achieve:

- simplified installation
- savings in panel space
- direct connection to building network systems

Dialogue

The graphic terminal can be multipoint connected to several drives. The Altivar 61 drive is also available with a 7-segment display for ratings up to and including 20 HP @230Vac and 100 HP @460Vac for the most economical solution.

EMC mastered

Incorporating level A conducted and radiated EMC filters, the Altivar 61 drive simplifies installation and establishes conformity of the machine for CE marking, without additional costs.



“Power Removal” function

Conforming to the machine standard EN 954-1 category 3 and the standard for electrical installations IEC/EN 61508-1 SIL2, and certified by a competent body (INERIS), it enables:

- easier machine certification
- elimination of electromechanical relays
- reduced wiring and installation times
- space savings in enclosures

For any *Mounting* requirement:

On a wall

- Simple compact installation use the Type 1 conduit kit

Reduce enclosure size

- side by side mounting reduces panel space
- industry leading 50° C rating
- externally mounting the heat sink with kit

In severe environments

- resistance to corrosive environments conforming to class 3C2 of IEC 60721-3-3
- Exposed copper is tinned, circuit boards are conformal coated in critical areas, and plastics are treated to better withstand the corrosive nature of certain oils. (This protection is standard on products 75 HP and higher @ 230 VAC and on 125 HP and higher @ 460 VAC. Add S337 to the end of the catalog number to receive this protection on smaller horsepower products)

Modular configuration

When you require additional inputs or outputs, a communication network connection or desire decentralized equipment control, you can select up to two option cards that snap in without requiring additional panel space

■ *Input/output extension* cards:

Logic inputs, open collector outputs, relay, PTC probe input, analog inputs, analog outputs, pulse input

■ *Communication* cards:

for connection to the main communication networks available on the market

For building networks:

Lonworks, BACnet, Metasys N2, Apogee FLN P1

For industrial networks:

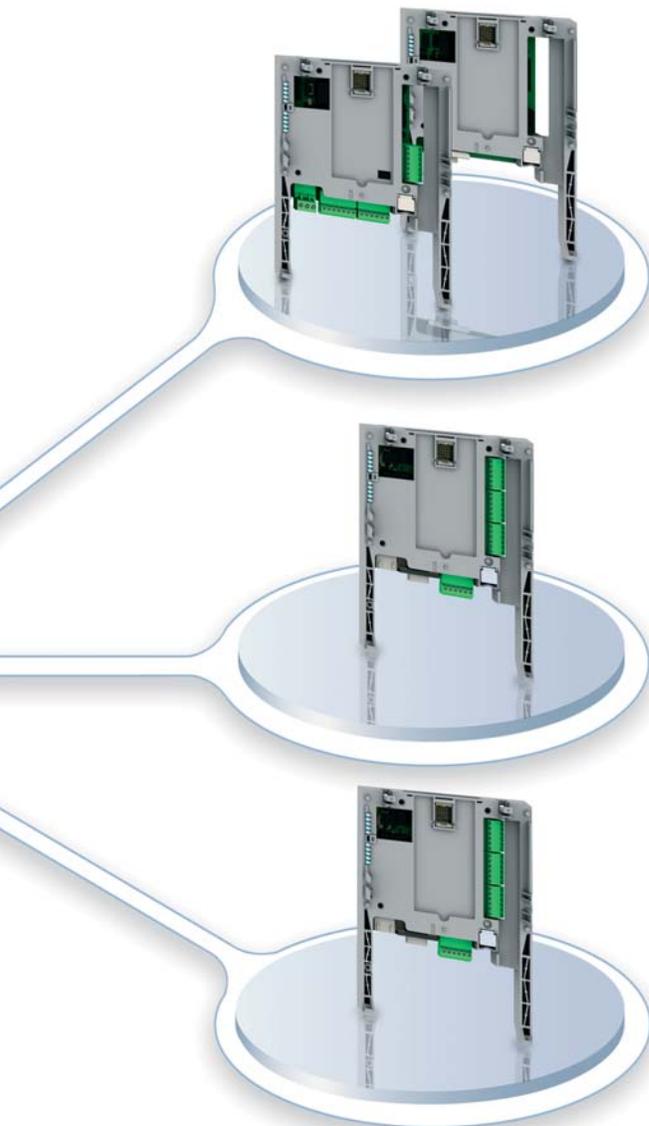
Fipio, Ethernet, Modbus Plus, Profibus DP, DeviceNet, Uni-Telway, InterBus

■ *Controller Inside* programmable card:

Allows integration of simple programs in the drive for an OEM or integrator to provide a unique solutions

■ *The pump application* option card incorporates application functions for managing pumps

- Single pump or multiple pump management with up to four pump motors with variable speed and fixed speed motors
- Management of relative operating time
- Set-up screens minimize start-up
- Activate only the functions your system requires
- Instrumentation scaling
- Real time clock
- System status and fault messaging



Go *green* with the Altivar® 61 Drive!

Let the Altivar 61 drive operate your buildings with greater efficiency. Using the Altivar 61 drive on fans and pumps can significantly reduce your energy costs. In many instances, the payback period for using an adjustable frequency drive in place of other flow control methods is less than 18 months.

Most HVAC systems are designed to keep the building cool on the hottest days and warm on the coldest days. Therefore, the HVAC system only needs to work at full capacity on the 10 or so hottest days and the 10 or so coldest days of the year. On the other 345 days, the HVAC system may operate at a reduced capacity. This is where a variable air volume system with variable frequency drives (VFDs) can be used to match air flow to actual heating and cooling demands. The VFD can reduce the motor speed when full flow is not required, thereby reducing the power required and the electrical energy used.



An Example of an Energy Saving Calculation*

A fan with a 20 horsepower motor supplies air 10 hours a day for 260 days a year and the energy cost is \$0.10 cents per kilowatt-hour. Cost of running full speed:

$$20 \text{ hp} \times 0.746 \text{ kW/hp} \times 2600 \text{ hours} \times \$0.10/\text{kWhr} = \mathbf{\$3879.20}$$

Assuming the fan does not need to run at full speed all of the time, let's use an example of:

- Running full speed (100%) for 25% of the time
- 80% speed for 50% of the time
- 60% speed for the remaining 25% of the time

Cost of running with an AC drive controlling the motor:

$$20 \text{ hp} \times (1) \times 0.746 \text{ kW/hp} \times 650 \text{ hours} \times \$0.10/\text{kWhr} = \$969.80$$

$$20 \text{ hp} \times (0.8)^3 \times 0.746 \text{ kW/hp} \times 1300 \text{ hours} \times \$0.10/\text{kWhr} = \$993.08$$

$$20 \text{ hp} \times (0.6)^3 \times 0.746 \text{ kW/hp} \times 650 \text{ hours} \times \$0.10/\text{kWhr} = \$209.48$$

$$\mathbf{Total = \$2172.36}$$

$$\mathbf{Annual savings: \$3879.20 - \$2172.36 = \$1706.84}$$

Actual results may vary for closed loop pumping and variable air volume systems.

Conserving Earth's *Energy*

A variable air/water/refrigerant volume HVAC system controlled by VFDs can go a long way in helping a new or existing building achieve greater energy efficiency. Not only will HVAC systems run by VFDs save money, but they also will increase the comfort of the building and reduce equipment maintenance costs and downtime. Plus, meeting the requirements of the Energy Policy Act of 2005 and achieving a more "green" system through LEED certification can offer more money-saving opportunities if the building is eligible for state and local government incentives. Ultimately, more efficient HVAC systems create more energy efficient buildings, which in turn conserves energy resources across the U.S. and the world.

Altivar® 61 Drives *Eco-Design:* thinking of the future

Within its sustainable development policy, Schneider Electric is committed to environmental friendliness:

“Our products safeguard life, make goods safer and optimize the consumption of energy and natural resources. We are actively involved in design, production, distribution and recycling processes that are environmentally friendly. Protection of the environment forms an integral part of our strategic decision making.”

ISO 14 001 certified sites for their manufacturing operations:

- Pacy-sur-Eure/France
 - Houston TX/USA
 - Mie/Japan
- and certified for their Eco-Design cycles

The new generation of **Altivar 61 drives** benefits from an **Eco-Design** approach. The same importance has been given to the “environment” criterion as that for other criteria, such as: performance, quality, ergonomics...and this applies to each stage of the **life cycle of the product*** (manufacture, distribution, usage and end of life).

Exemplary end of life recovery ...

88% of the parts used for the Altivar 61 drive are recyclable. They enable the recuperation of energy (incineration with energy recuperation) or of material (recycling, composting) conforming to the European directive WEEE (Waste Electrical & Electronic Equipment).

With Eco-Design



Without Eco-Design



70 %

Recovery rate imposed by the European directive WEEE.

... due to a strict selection and ideal combination of materials

Materials used for the **Altivar 61 drive** have been selected for their minimal impact on the environment. Conformity to the European directive ROHS (Restriction Of Hazardous Substances) that prohibits the use of materials such as lead, cadmium, mercury and hexavalent chromium.

*For the complete “Product Environmental Profile” document relating to the entire range, please contact Schneider Electric.

Analysis carried out using EIME (Environmental Information and Management Explorer) software and based on international averages.

The *green building* movement is on!

The Altivar 61 drive can help create green buildings. The U.S. Green Building Council® (USGBC) developed and administered the LEED® (Leadership in Energy and Environmental Design) Green Building Rating System™, to define green buildings. One of the prerequisites of the LEED-NC Energy and Atmosphere component is meeting both the mandatory provisions and prescriptive/performance requirements of ASHRAE 90.1-2004. This standard sets minimum requirements to promote the principles of effective, energy-conserving

design for buildings and building systems. More specifically, the ASHRAE prescriptive strongly recommends that HVAC systems with total fan power greater than 5 hp have variable air volume fan control and that individual variable air volume fans with motors greater than or equal to 15 hp have variable speed drives.

For government buildings, government regulations such as the Energy Policy Act of 2005 (EPAAct) mandate energy monitoring and energy efficiency improvements. LEED certification alone has its benefits. In addition to saving energy costs, it also allows the building owner to take advantage of state and local government incentives and makes the building project more marketable to tenants who are seeking more energy-efficient/sustainable facilities.

The Altivar 61 drive can help create green buildings by providing gains in energy efficiency, easier commissioning and monitoring of the building, and by its Eco-Design.

Altivar® 61 Drives Electrical Specifications

Input Voltage	200 -15% to 240 +10%, 380 -15% to 480 +10%
Displacement Power Factor	98% through speed range
Input Frequency	50 Hz -5% to 60 Hz +5%
Drive Input Section	Six pulse bridge rectifier
Drive Output Section	Three Phase, IGBT Inverter with Pulse Width Modulated (PWM) output Maximum voltage equal to input voltage
Galvanic Isolation	Galvanic isolation between power and control (inputs, outputs and power supplies)
Frequency Range of Power Converter	0.5 to 500 Hz
Torque/overtorque	110% of nominal motor torque for 60 s, minimum
Current (transient)	110% of controller rated current for 60 s, minimum
Switching Frequency	Selectable from 1 to 16 kHz, 12 kHz nominal rating for 1-60 hp @ 200/240 V, 1-100 hp @ 380/480 V. Selectable: 2.5 to 8 kHz, 2.5 kHz nominal rating for 75-125 hp @ 200/240 V 125-900 hp @ 380/480 V.
Speed Reference Inputs	AI: 0 to +10 V, Impedance = 30 kOhms Used for Speed potentiometer, 1-10 kOhms AI2: Factory setting = 4 to 20mA, software configurable for current, (0-20mA, X-Y) or voltage
Analog Reference Resolution	0.1 for 100 Hz (11 bits)
I/O Sampling Time	2 ms +/- 0.5 ms on analog inputs & outputs, & logic inputs, 7 ms +/- 0.5 ms on relay outputs
Power Removal/Run Permissive Input	24Vdc input, for use to prohibit unintended equipment operation
Efficiency	98% at full load typical
Acceleration and Deceleration Ramps	0.1 to 999.9 seconds (definition in 0.1 s increments)
Skip Frequencies	Three configurable skip frequency/jump frequency bands
Motor Control Profiles	Energy economizer (flux optimization) motor algorithm to maximize energy savings. (Automatically optimizes voltage based on load.) or select from 2 point or 5 point volts/hertz profile or SLFV (sensorless flux vector)
Speed Range	1 to 100, open loop
Motor Protection	Class 10 electronic overload protection or PTC probe
Graphic Display Terminal	Simply Start menu, PID set-up menu, network set-up menu, Logic I/O & Analog I/O mapping and status, Monitoring and self diagnostics with fault messages and status such as; Power on time, elapsed time, motor run time, line voltage, motor current, ready to run, running, motor speed
Compliance	RoHS and WEEE (Waste Electrical & Electronic Equipment compliant)
Codes and Standards	UL, CSA, NOM 117, DNV, CE, C-Tick, GOST, UL 1995 Plenum rated, SEMI-F47 certified for voltage dip ride-through

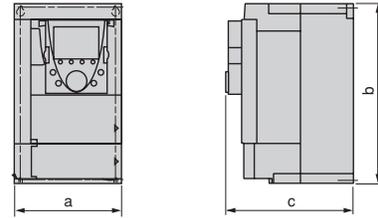
Altivar® 61 Drives Environmental Specifications

Temperature	Operation:+14 to + 122° F (-10 to +50° C) Storage:-13 to +158° F (-25 to +70° C)
Humidity	95% with no condensation or dripping water, conforming to IEC 600068-2-3.
Altitude	3,300 ft. (1,000 m) without derating; 3,300- 9850 ft (1,000-3,000 m) derate output current by 1% for each additional 330 ft. (100 m). 6560 ft (2000m) maximum for corner grounded distribution system.
Enclosure Rating	<i>1-60 hp @ 200/240 V, 1-100 hp @ 380/480 V:</i> IP 41 on top IP21 on all other surfaces, Type 1 with optional conduit kit. <i>75-125 hp @ 200/240 V, 125-500 hp @ 380/480 V:</i> IP 41 on top, IP30 sides & front IP00 on bottom, Type 1 w/ optional conduit kit. 600 -900 hp @ 380/480 V. IP 41 on top, IP30 sides and front, IP00 on bottom
Pollution Degree	<i>1-20 hp @ 200/240 V, 1-25 hp @ 380/480 V:</i> Pollution degree 2 per IEC/EN 61800-5-1, Option S337 provides protection per IEC 60721-3-3 Class 3C2 <i>25-60 hp @ 200/240 V, 30-100 hp @ 380/480V:</i> Pollution degree 3 per IEC/EN 61800-5-1, Option S337 provides protection per IEC 60721-3-3 Class 3C2 <i>60-125hp @ 200/240 V, 125-900 hp @ 380/480V:</i> Pollution degree 3 per IEC/EN 61800-5-1 and protection per IEC 60721-3-3 Class 3C2
Vibration Resistance	1-60hp @ 200/240V 1-100 hp @ 380/480 V Conforming to IEC/EN 60068-2-6 1.5mm peak to peak from 3 to 13 Hz, 1gn from 13 to 200 Hz. 75-125 hp @ 200/240V, 125-900 hp @ 380/480V: Conforming to IEC/EN 60068-2-6 1.5mm peak to peak from 3 to 10 Hz, 0.6gn from 10 to 200 Hz.
Shock Resistance	1-60 hp @ 200/240 V, 1-100 hp @ 380/480 V: 15gn for 11ms conforming to IEC/EN 600068-2-27 75-125 hp @ 200/240 V, 125-500 hp @ 380/480 V: 7gn for 11ms conforming to IEC/EN 600068-2-27 600-900 hp @ 380/480 V. 4gn for 11ms conforming to IEC/EN 600068-2-27

Altivar® 61 Drives Dimensions and Weights

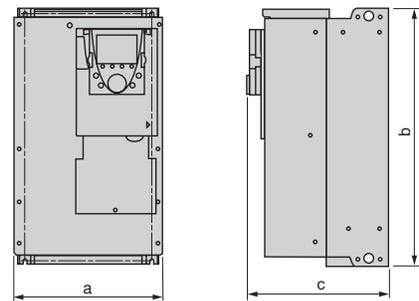
With LCD Graphic Display Terminal

Frame Size	a Width		b Height		c Depth		Weight		b Height with Type 1 Kit	
	mm	In.	mm	In.	mm	In.	kg.	lbs.	mm	In.
1	130	5.12	230	9.06	175	6.89	3	6.61	357	14.05
2	155	6.10	260	10.24	187	7.36	4	8.82	387	15.23
3	175	6.89	295	11.61	187	7.36	5.5	12.13	422	16.61
4	210	8.27	295	11.61	213	8.39	7	15.43	396	15.61
5	230	9.06	400	15.75	213	8.39	9	19.84	502	19.75



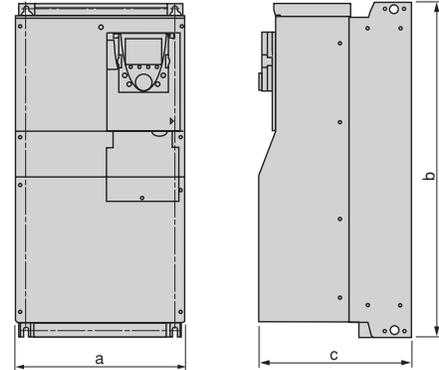
For a drive without a graphic display terminal, the depth is reduced by 26mm (1.02 in)
 For a drive with one option card installed, the depth is increases 23mm (0.91 in)
 For a drive with two option cards installed, the depth is increases 46mm (1.81 in)

Frame Size	a Width		b Height		c Depth		Weight		b Height with Type 1 Kit	
	mm	In.	mm	In.	mm	In.	kg.	lbs.	mm	In.
6	240	9.45	420	16.54	236	9.29	30	66.14	547	21.54
7	240	9.45	550	21.65	266	10.47	37	81.57	677	26.65
8	320	12.60	550	21.65	266	10.47	37	81.87	753	29.65
9	320	12.60	630	24.80	290	11.42	45	99.21	833	32.80



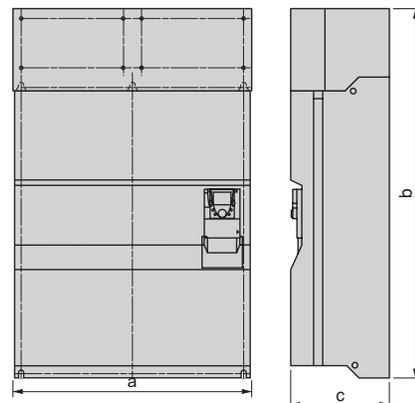
For a drive without a graphic display terminal, the depth is reduced by 26mm (1.02 in)
 For a drive with one option card installed, the depth is increases 23mm (0.91 in)
 For a drive with two option cards installed, the depth is increases 46mm (1.81 in)

Frame Size	a Width		b Height		c Depth		Weight		b Height with Type 1 Kit	
	mm	In.	mm	In.	mm	In.	kg.	lbs.	mm	In.
10	320	12.60	920	36.22	377	14.84	74	163	985	38.77
11	360	14.17	1022	40.24	377	14.84	80	176	1188	46.79
12	340	13.39	1190	46.85	377	14.84	110	242	1471	57.90
13	440	17.32	1190	46.85	377	14.84	140	309	1407	55.40
14	595	23.43	1190	46.85	377	14.84	215	474	1458	57.40



For a drive with one option card installed, the depth remains the same
 For a drive with two option cards installed, the depth is increases 15mm (0.59 in)

Frame Size	a Width		b Height		c Depth		Weight	
	mm	In.	mm	In.	mm	In.	kg.	lbs.
15	890	35.04	1390	54.72	377	14.84	225	496
16	1120	44.09	1390	54.72	377	14.84	300	661



For a drive with one option card installed, the depth remains the same
 For a drive with two option cards installed, the depth is increases 15mm (0.59 in)

Altivar® 61 Drives Selection guide

Supply voltage: 3-phase 200...240V

Motor		Drive		Frame size
kW	HP	Amps	References (LCD keypad included)	
0.75	1	4.8	ATV61H075M3 ⁽¹⁾	1
1.5	2	8	ATV61HU15M3 ⁽¹⁾	1
2.2	3	11	ATV61HU22M3 ⁽¹⁾	2
3	–	13.7	ATV61HU30M3 ⁽¹⁾	2
4	5	17.5	ATV61HU40M3 ⁽²⁾	2
5.5	7.5	27.5	ATV61HU55M3 ⁽²⁾	3
7.5	10	33	ATV61HU75M3 ⁽²⁾	4
11	15	54	ATV61HD11M3X ⁽³⁾	5
15	20	66	ATV61HD15M3X ⁽³⁾	5
18.5	25	75	ATV61HD18M3X ⁽³⁾	6
22	30	88	ATV61HD22M3X ⁽³⁾	6
30	40	120	ATV61HD30M3X ⁽³⁾	8
37	50	144	ATV61HD37M3X ⁽³⁾	8
45	60	176	ATV61HD45M3X ⁽³⁾	8
55	75	221	ATV61HD55M3X ⁽³⁾⁽⁴⁾	10
75	100	285	ATV61HD75M3X ⁽³⁾⁽⁴⁾	10
90	125	359	ATV61HD90M3X ⁽³⁾⁽⁴⁾	11

For 20 HP and smaller, add the letter "Z" to the end of the reference for an Altivar 61 to receive the drive with an LED keypad in place of the LCD keypad.

- (1) For single-phase 0.75 to 7.5 kW range, select the next rating up (example: 2.2 kW - reference = ATV61HU30M3).
- (2) For single-phase operation, select the next rating up and add a line choke.
- (3) Without EMC filter.
- (4) With integrated DC bus inductance.

Supply voltage: 3-phase 380...480V

Motor		Drive		Frame size
kW	HP	Amps	References (LCD keypad included)	
0.75	1	2.3	ATV61H075N4 ⁽⁴⁾	1
1.5	2	4.1	ATV61HU15N4 ⁽⁴⁾	1
2.2	3	5.8	ATV61HU22N4 ⁽⁴⁾	1
3	–	7.8	ATV61HU30N4 ⁽⁴⁾	2
4	5	10.5	ATV61HU40N4 ⁽⁴⁾	2
5.5	7.5	14.3	ATV61HU55N4 ⁽⁴⁾	3
7.5	10	17.6	ATV61HU75N4 ⁽⁴⁾	3
11	15	27.7	ATV61HD11N4 ⁽⁴⁾	4
15	20	33	ATV61HD15N4 ⁽⁴⁾	5
18.5	25	41	ATV61HD18N4	5
22	30	48	ATV61HD22N4	6
30	40	66	ATV61HD30N4	7
37	50	79	ATV61HD37N4	7
45	60	94	ATV61HD45N4	9
55	75	116	ATV61HD55N4	9
75	100	160	ATV61HD75N4	9
90	125	179	ATV61HD90N4 ⁽⁵⁾	10
110	150	215	ATV61HC11N4 ⁽⁵⁾	10
132	200	259	ATV61HC13N4 ⁽⁵⁾	11
160	250	314	ATV61HC16N4 ⁽⁵⁾	12
220	350	427	ATV61HC22N4 ⁽⁵⁾	13
250	400	481	ATV61HC25N4 ⁽⁵⁾	14
315	500	616	ATV61HC31N4 ⁽⁵⁾	14
400	600	759	ATV61HC40N4 ⁽⁵⁾	15
500	700	941	ATV61HC50N4 ⁽⁵⁾	15
630	900	1188	ATV61HC63N4 ⁽⁵⁾	16

- (4) For 100 HP and smaller, add the letter "Z" to the end of the reference for an Altivar 61 to receive the drive with an LED keypad in place of the LCD keypad.
- (5) With integrated DC bus inductance.

Inputs/outputs on board

- Analog input #1: +/- 10Vdc bipolar input, 1 bits + 1 sign resolution, 2ms +/- .5ms sample time
- Analog input #2: software selectable for 1-10Vdc or x-y mA
x-y selectable from 0-20mA,
11 bits resolution, 2ms +/- .5ms sample time
- Analog output #1: software selectable for 1-10Vdc or x-y mA
x-y selectable from 0-20mA,
10 bits resolution, 2ms +/- .5ms sample time
- Relay output #1: one NO (normally open) one NC (normally closed)
- Relay output #2: one NO (normally open)
- 6 logic inputs 24Vdc, 2ms +/- .5ms sample time
Multiple function assignment possible
Positive logic (source) or Negative logic (sink) choice LI6 offers PTC probe assignment
- Power Removal input: 1 input for interlocking function (run permissive)
- RJ45 port Modbus or CANopen (selectable)

PowerSuite software workshop

- PowerSuite CD-ROM for PC _____ VW3 A 8104
- Connection kit for PC _____ VW3 A 8106
- Adaptor for wireless link Modbus-Bluetooth® _____ VW3 A 8114

Input/output cards

- Logic inputs/outputs**
- 1 voltage output, 24V
- 1 voltage output, -10V
- 1 logic output, relay
- 4 programmable logic inputs
- 2 assignable logic outputs with open collector
- 1 input for 6 PTC probes max. _____ VW3 A 3201
- Extended inputs/outputs**
- Same as logic inputs/outputs card +
- 2 analog inputs
- 2 analog outputs
- 1 pulse input _____ VW3 A 3202

Communication cards

- Modbus Plus _____ VW3 A 3302
- Uni-Telway _____ VW3 A 3303
- InterBus _____ VW3 A 3304
- Profibus DP _____ VW3 A 3307
- DeviceNet _____ VW3 A 3309
- Ethernet _____ VW3 A 3310
- Fipio _____ VW3 A 3311
- LonWorks _____ VW3 A 3312
- METASYS N2 _____ VW3 A 3313
- APOGEE FLN _____ VW3 A 3314
- BACnet _____ VW3 A 3315

Controller Inside programmable card

- _____ VW3 A 3501

- Pump application card _____ VW3 A 3503

Watertronics® Owners Guide



This guide is intended solely for the purpose of giving a better understanding of the Watertronics® Pumping Systems. Watertronics® assumes no responsibility or liability due to the use or misuse of this manual.

Reproduction of the contents of this publication, in whole or part, without written permission of Watertronics, Inc is strictly prohibited.



Identifies information about practices or circumstances that can lead to personnel injury, death, property loss or economic loss.

Publish Date 02/06/2012
Copyright Watertronics LLC 2009

Getting Started
SYSTEM SETUP



1. **CAUTION!** Before opening & entering the electrical control panel, ensure that the door-mounted main disconnect switch is in the **OFF** position.



2. **WARNING! MAIN DISCONNECT SWITCH upper lugs are always energized.** While this area has a degree of shielding, exercise extreme caution when working near this area. **CAUTION!** The CONTROL ENCLOSURE may contain a foreign voltage from an external source NOT routed through the Main Disconnect Switch. If so, determine location of source and lock it in the **OFF** position.



3. **CAUTION! VFD** units have charged capacitors that hold high voltages even after power has been removed from the unit. Before working in the electrical control panel wait a minimum of 10 minutes after the main power has been removed for these voltages to subside.
4. Check mounting & termination of all electrical equipment. Studs, screws and nuts should all be in place. Wire terminals can vibrate loose during transit to the job site as well as over prolonged periods of operation. Re-torque as needed during initial setup on the job site and periodically thereafter (spring and fall).
5. All wiring must be free of kinks, torn, charred, or missing insulation. If there is evidence of short circuit, over current, or water damage, the pump station must not be placed into service until the cause is identified & corrected.

Common equipment located inside control enclosure:

- POWER DISTRIBUTION BLOCK
- FUSE BLOCKS (POWER & CONTROL FUSES)
- VARIABLE FREQUENCY DRIVE (VFD)
- PHASE VOLTAGE MONITOR
- DUPLEX OUTLET RECEPTACLE
- 115 VAC CONTROL TRANSFORMER
- 24VDC POWER SUPPLY
- PANASONIC PLC
- DOOR MOUNTED DISPLAY UNIT
- CONTROL RELAYS
- DOOR-MOUNTED PUSHBUTTONS AND SELECTOR SWITCHES
- CABINET INTERIOR LIGHT FIXTURE

Check that all components are secured in their mountings after shipment.

SYSTEM SETUP

(Continued...Page 2 of 2)

Common equipment located outside control enclosure:

- LIGHTNING ARRESTOR: Check for surge damage, charring or swelling
- PRESSURE SENSOR: Check for leaks/damage; keep connections clean
- FLOW SENSOR: Same as pressure sensor
- PUMP MOTOR(s): Ensure that terminal box covers & coupling guards are in place
- PRESSURE RELIEF VALVE: Keep discharge piping free from obstruction



5. **CAUTION!** The pump station and associated piping is under PRESSURE. Close the gate valve to isolate the station from the irrigation system and drain the water from the station before adjusting or removing any plumbing, fittings, etc.. Failure to de-pressurize the system may result in INJURY.

6. The pump station electrical control enclosure and/or mounting skid must be electrically connected to EARTH GROUND.



7. **ALL ELECTRICAL CONNECTIONS MUST BE MADE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND/OR LOCAL CITY OR STATE CODES.**

SYSTEM CHECK OUT PROCEDURE

This procedure must be performed prior to new system start-up, or for restarting the station after it has been out of service for an extended time.

1. Turn MAIN DISCONNECT switch to the OFF position.
2. HAND/OFF/AUTO (HOA) switches must be in the OFF position.
3. Review SYSTEM SETUP detailed in the previous pages.
4. All PETCOCK VALVES must be CLOSED. Through out the pumping system there are several drains and vents to check. Locate all open drain valves and plugs and seal them OFF. Common locations for drains are low points, where water can be trapped, such as on the underside of the discharge piping and on the underside of each CHECK VALVE.
5. Check the PRESSURE RELIEF VALVE (PRV) assembly (see Section Four Tab - 11 figure). The BALL VALVE must be OPEN. This is when the Yellow HANDLE is IN-LINE with the valve body. The PRV isolation valve must be open.
6. The discharge system ISOLATION VALVE must be CLOSED. This is the large butterfly valve located on the end of the discharge manifold (where it mates with the irrigation system piping).

SYSTEM START-UP PROCEDURE

After the Check out Procedure, the Station is ready for Start-Up.

1. Turn MAIN DISCONNECT switch to the ON position.
2. Turn PANEL POWER selector switch to the ON position.
3. The DISPLAY UNIT should now be powered-up, displaying the SELECT screen (see Section Three - Tab 7).

NOTE: If the DISPLAY UNIT does NOT power-up, it could mean that the PHASE VOLTAGE MONITOR has cut off power to the controls. This occurs if the incoming power is not in conformity with the settings of the monitor. If the green light on the phase monitor is not illuminated, please call Watertronics.

--- WARNING !! ---



This equipment contains *LIFE THREATENING VOLTAGES*. Exercise *EXTREME CAUTION* when working inside the control panel. Never open the electrical control panel until you have **TURNED OFF** all power.

4. Upon power-up the DISPLAY UNIT will display a PHASE/VOLTAGE alarm. To clear the alarm, press the red RESET button.
5. Press RETURN TO THE SELECT SCREEN button to call up the SELECT screen. Press MAIN on the SELECT screen.
6. Each motor needs to be jogged to check for proper rotation. Motor line shafts on VT models should NOT BE installed at this time or damage will occur to the pump if rotated backward. Monitoring discharge pressure while running can check submersible pump rotation. If pressure is low, TURN OFF the MAIN DISCONNECT and rotate motor power leads. Reapply power to run the pump and pressure should climb to design point.
7. Install all pump shafts as necessary.
8. Starting from the fully closed position, rotate the hand wheel on the discharge system ISOLATION VALVE 2 TURNS. (This is the large butterfly valve located on the end of the discharge manifold, where it mates with the irrigation system piping). This will limit flow from the pump system, ensuring no damage to the irrigation piping. It is also recommended several heads be opened to allow the air in the irrigation piping to escape.

SYSTEM START-UP PROCEDURE

(Continued...Page 2 of 2)

9. At this time Pipe Saver may be activated to automatically fill the piping system (see Section Three Tab - 7)
10. Turn the **HAND/OFF/AUTO** (HOA) selector switches to the AUTO position.

-- CAUTION ---

**IF THE SYSTEM PRESSURE IS LOW, OR THERE IS A FLOW DEMAND,
THE PUMP STATION MAY START AUTOMATICALLY!**



11. After the piping has filled, turn all pumps to the OFF position using the (HOA) selector switches. Open fully the discharge System Isolation valve.
12. Turn the **HAND/OFF/AUTO** (HOA) selector switches to the AUTO position.
13. The Pump(s) should now sequence ON & OFF depending on system demand.

BASIC SYSTEM OPERATION

A Watertronics® Pump Station is designed to operate automatically. When placed in the AUTO MODE, the station's control system (PLC) responds to demand for water by the irrigation system. This demand results in a drop in system pressure, and also activates the flow sensor. Because it is continuously monitoring signals from the PRESSURE and the FLOW SENSOR, the PLC senses the change in system conditions and (after checking for alarm conditions) determines which pump(s) to turn on or off to meet the system demand. Pump output is regulated to adjust the pump systems output to the water demand. This regulation is accomplished in two ways, an Electronics Butterfly Valve (EBV) or a Variable Frequency Drive (VFD).

~~ELECTRONIC BUTTERFLY VALVES (EBV'S)~~

- ~~• Each pump on a Watertronics Pump Station can be equipped with an Electronic Butterfly Valve (EBV). Each EBV is automatically controlled by the PLC to modulate open/closed as required to maintain a constant pressure in the irrigation system and reduce water hammer and surging.~~
- ~~• Prior to pump start-up or shut down, the PLC will close the EBV. After a pump is turned on, the EBV will be opened gradually. Once it is determined by the PLC that a pump is no longer needed, and can be turned off, the EBV will be commanded to close gradually. The pump will be shut down only after the EBV is closed. This method of automatic valve control eliminates abrupt transitions in system pressure during pump sequencing, which results in a significant reduction of line surges.~~

VARIABLE FREQUENCY DRIVE (VFD)

- Variable Frequency Drives (VFD) deliver smooth, surge-free performance across the station's entire operating range. Lower utility costs are an additional benefit because pumps consume only the minimum electrical energy required to meet demand. During motor start-up, the VFD provides a ramped, reduced voltage start, eliminating inrush current. There is no wasted output diverted by hydraulic regulation or relief of excess pressure. In addition, motors, pumps & piping are less stressed, delivering a longer life expectancy.
- VFD operation converts fixed frequency AC line voltage into adjustable frequency power necessary to operate the station's three-phase AC motors at variable speeds. AC line voltage is first converted to a fixed DC voltage. The inverter uses pulse-width modulation (PWM) technology to produce variable width output pulses to create a simulated AC sine wave to change motor speed. The PLC delivers a REFERENCE SPEED to the VFD, which regulates the pressure to the irrigation system.

BASIC SYSTEM OPERATION

(Continued...Page 2 of 2)

As a precautionary measure, the Pump Station is designed to protect itself from potential damage by TURNING OFF if the control system detects an ALARM condition. This condition will be indicated by an **ALARM!** Message being displayed on the DISPLAY UNIT. Should this situation occur, take the necessary steps to correct the indicated Alarm Condition (see Section Three Tab 6). When the problem is corrected press the red RESET button on the Electrical Control Enclosure door to clear the alarm.

ALARM CONDITIONS & SHUTDOWNS

There are number of possible causes for Alarm Conditions. Refer to the Troubleshooting Guide section of this manual for detailed explanations. After the cause has been determined, & corrected, reset the station by pressing the red RESET button.



CAUTION! Pump station must never be operated in manual mode as a means of bypassing any alarm protection.

- **Low Pressure Alarm:**

While pumps are running and enabled, the pressure sensor monitors discharge pipe pressure and if the pressure drops below a predetermined set point (usually 20 PSI below regulate pressure) -- and stays there for a predetermined time (usually 4 minutes) without self-correcting -- the PLC will trigger a LOW PRESSURE alarm condition and SHUT-OFF the enabled running pumps.

- **High Pressure Alarm:**

While pumps are running and enabled, the pressure sensor monitors discharge pipe pressure and if the pressure rises above a predetermined set point (usually 11 PSI above regulate pressure) -- and stays there for a predetermined time (usually 2 minutes) without self-correcting -- the PLC will trigger a HIGH PRESSURE alarm condition and SHUT-OFF the enabled running pumps.

- **Power Alarm:**

A Power Alarm will be displayed in the event of a power loss or imbalance to the pump station.

- **Control Power Alarm:**

A Control Power Alarm will be displayed if power is lost to the PLC and restored.

- **Low Level Alarm: (If so equipped)**

A Low Water Alarm will be displayed in the event the water level of the pumps water source sensed by a level transducer drops below the configured setting and remains there for the configured time. Depending on the system configuration this alarm may shutdown enabled running pumps.

ALARM CONDITIONS & SHUTDOWNS

(Continued...Page 2 of 6)

- ~~Low Low Level Alarm: (If so equipped)~~

~~A Low Low Water Alarm will be displayed in the event the water level of the pumps water source sensed by a level transducer drops below the configured setting and remains there for the configured time. Depending on the system configuration this alarm may shutdown enabled running pumps.~~

- Low Float Alarm: (If so equipped)

A Low Float Alarm will be displayed in the event the water level of the pumps water source sensed by a ball float drops below the sensor's mechanical height and remains there for the configured time. Depending on the system configuration this alarm may shutdown enabled running pumps.

- ~~Low Low Float Alarm: (If so equipped)~~

~~A Low Low Float Alarm will be displayed in the event the water level of the pumps water source sensed by a ball float drops below the sensor's mechanical height and remains there for the configured time. Depending on the system configuration this alarm may shutdown enabled running pumps.~~

- High Level Alarm: (If so equipped)

A High Water Alarm will be displayed in the event the water level of the pumps water source sensed by a level transducer rises above the configured setting and remains there for the configured time. Depending on the system configuration this alarm may shutdown enabled running pumps.

- ~~High High Level Alarm: (If so equipped)~~

~~A High High Water Alarm will be displayed in the event the water level of the pumps water source sensed by a level transducer rises above the configured setting and remains there for the configured time. Depending on the system configuration this alarm may shutdown enabled running pumps.~~

- ~~High Float Alarm: (If so equipped)~~

~~A High Float Alarm will be displayed in the event the water level of the pumps water source sensed by a ball float rises above the sensor's mechanical height and remains there for the configured time. Depending on the system configuration this alarm may shutdown enabled running pumps.~~

ALARM CONDITIONS & SHUTDOWNS

(Continued...Page 3 of 6)

- ~~High High Float Alarm: (If so equipped)~~

~~A High High Float Alarm will be displayed in the event the water level of the pumps water source sensed by a ball float rises above the sensor's mechanical height and remains there for the configured time. Depending on the system configuration this alarm may shutdown enabled running pumps.~~

- ~~Low Inlet Pressure Alarm: (If so equipped)~~

~~While pumps are running and enabled, the pressure sensor monitors inlet pipe pressure and if the pressure drops below a predetermined set point and stays there for a predetermined time without self-correcting the PLC will trigger a Low Inlet Pressure alarm condition and shut off the enabled running pumps.~~

- ~~Low Low Inlet Pressure Alarm: (If so equipped)~~

~~While pumps are running and enabled, the pressure sensor monitors inlet pipe pressure and if the pressure drops below a predetermined set point and stays there for a predetermined time without self-correcting the PLC will trigger a Low Low Inlet Pressure alarm condition and shut off the enabled running pumps.~~

- ~~High Inlet Pressure Alarm: (If so equipped)~~

~~While pumps are running and enabled, the pressure sensor monitors inlet pipe pressure and if the pressure rises above a predetermined set point and stays there for a predetermined time without self-correcting the PLC will trigger a High Inlet Pressure alarm condition. Depending on the system configuration this alarm may shutdown enabled running pumps.~~

- ~~High High Inlet Pressure Alarm: (If so equipped)~~

~~While pumps are running and enabled, the pressure sensor monitors inlet pipe pressure and if the pressure rises above a predetermined set point and stays there for a predetermined time without self-correcting the PLC will trigger a High High Inlet Pressure alarm condition. Depending on the system configuration this alarm may shutdown enabled running pumps.~~

- **Motor No. __ Alarm:**

A Motor Alarm will be displayed in the event the overload relay on the specified motor has tripped due to excessive current being drawn by the pump.

ALARM CONDITIONS & SHUTDOWNS

(Continued...Page 4 of 6)

- VFD Motor No. __ Alarm: (If so equipped)

A Variable Frequency Drive (VFD) Motor Alarm will be displayed if the PLC receives a signal from the VFD indicating a problem with the unit has occurred. The PLC will then automatically switch the pumps across-the-line and enable the Valve Regulation Mode if equipped.

- ~~● Soft Start Motor No. __ Alarm: (If so equipped)~~

~~A Soft Start Motor Alarm will be displayed if the PLC receives a signal from the Soft Start indicating a problem with the unit has occurred. Depending on the system configuration this alarm may shutdown enabled running pumps.~~

- Pipe Fill Alarm:

This alarm indicates that the Pump Station could not reach the Final Regulation Set point after attempting to pressurize the system. Depending on the system configuration this alarm may shutdown enabled running pumps.

- ~~● Pump No. __ Temp. Alarm: (If so equipped)~~

While a pump is running and enabled, the thermal sensors located on the pump monitors centrifugal pump temperature. Heat buildup exceeding that of normal operation (120 degrees or above) causes sensor contacts to close, signaling the PLC. If the condition does not self-correct within ten seconds, control logic will shut down the affected pump and displays a High Temperature alarm.

- ~~● System Shutdown by Remote: (If so equipped)~~

~~The system is capable of being shut down by a remote source. If configured and the remote switch closes the system will indicate a System Shutdown by Remote. Depending on the system configuration this alarm may shutdown enabled running pumps.~~

- ~~● Filter Alarm: (If so equipped)~~

If at any time the filter is unable to clear its collected debris in the given amount of retries the filter may need to be manually serviced and a Filter Alarm will be generated. Depending on the system configuration this alarm may shutdown enabled running pumps.

ALARM CONDITIONS & SHUTDOWNS

(Continued...Page 5 of 6)

~~• **BAS Intake Screen Alarm: (If so equipped)**~~

If at any time the intake screen is unable to clear its collected debris in the given amount of retries the screen may need to be manually serviced and a BAS Intake Screen Alarm will be generated. This alarm will shut down enabled running pumps.

~~• **System Shutdown by Remote: (If so equipped)**~~

The system is capable of being shut down by a remote source. If configured and the remote switch closes the system will indicate a System Shutdown by Remote. Depending on the system configuration this alarm may shutdown enabled running pumps.

~~• **Remote Alarm: (If so equipped)**~~

The system is capable of being shut down by a connected irrigation software or Watervision. If configured and the software commands a shutdown a Remote Alarm will be displayed. Depending on the system configuration this alarm may shutdown enabled running pumps.

~~• **Feature No. __ Alarm: (If so equipped)**~~

The system is capable of running additional feature pumps. If a feature pump reports an error a Feature Alarm will be generated. This alarm typically only affects the associated pump and not the irrigation pumps.

~~• **Chemigation No. __ Low Level Alarm: (If so equipped)**~~

The system is capable of running additional chemical injection pumps. If an injection pumps supply tank level drops below a predetermined set point a Chemigation Low Level Alarm will be generated. This alarm typically only affects the associated pump and not the irrigation pumps.

~~• **Chemigation No. __ Fault: (If so equipped)**~~

The system is capable of running additional chemical injection pumps. If an injection pump reports an error a Chemigation Fault will be generated. This alarm typically only affects the associated pump and not the irrigation pumps.

ALARM CONDITIONS & SHUTDOWNS

(Continued...Page 6 of 6)

- ~~Loss of Prime Alarm: (If so equipped)~~

~~On pump stations equipped with automated priming equipment, this alarm indicates that the priming pump was not able to prime the suction line of system in the configured amount of time. This alarm will disable and shutdown all pumps while attempting to continue priming the suction line. Depending on the system configuration, the pumps may automatically restart after successfully priming the system.~~

USING THE TOUCH SCREEN DISPLAY

The Watertronics Touch Screen Display is a powerful tool used to monitor and to change all aspects of Pump Station operation.

Select Menu



Overview Screen



Pump Screen

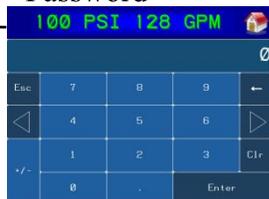


System Screen



SEE NEXT PAGE

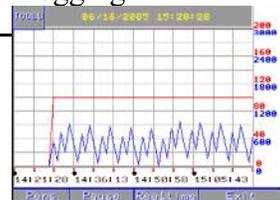
Password



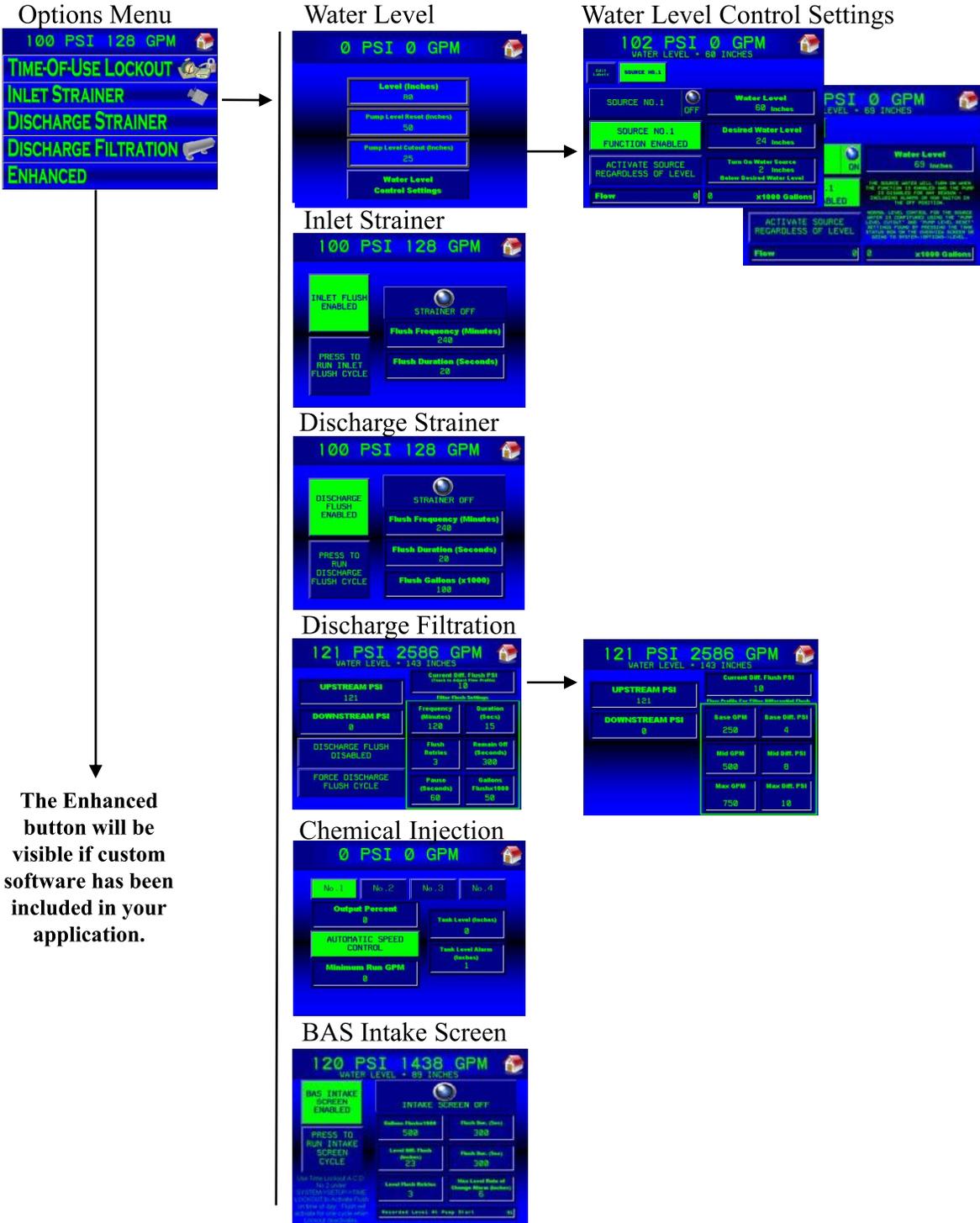
Settings Menu



Logging



Note: Options and the options menu will change based on supplied equipment.



Select Menu

Home Button:

Press this button on any other screen to return to this screen or return to the last menu screen.

Also displays common system information such as pressure, flow and water level.

Press to see the Overview Screen

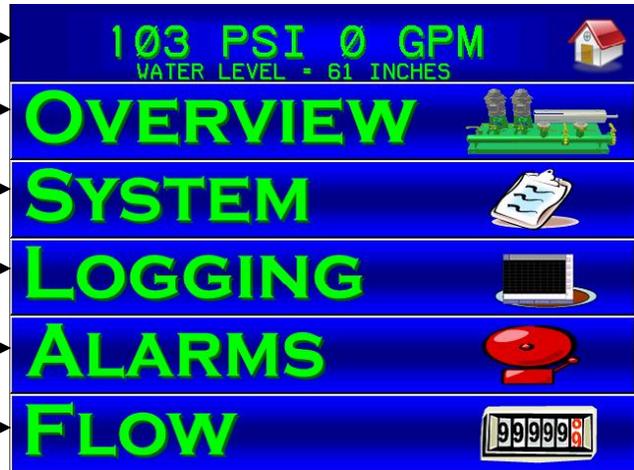
Press to see the System Screen

Press to see the Logging Screen

Press to see the Alarm Screen

Press to see the Flow Screen

Note: Button may not be present with all pumping systems.



Alarm Present



Options Menu

Note: Options may not be present on all pumping systems.

		100 PSI 128 GPM	
Press to see the Time of Use Controls	→	TIME-OF-USE LOCKOUT	
Press to see the Water Level Controls	→	WATER LEVEL	
Press to see the Inlet Strainer Controls	→	INLET STRAINER	
Press to see the Discharge Strainer Controls	→	DISCHARGE STRAINER	
Press to see the Discharge Filtration Controls	→	DISCHARGE FILTRATION	
Press to see the Chemical Injection Controls	→	CHEMICAL INJECTION	
Press to see the BAS Screen Controls	→	BAS INTAKE SCREEN	
Press to see the Water Feature Controls	→	WATERFEATURE	

Overview Screen

The Power Monitor displays the current energy used and power used by the booster. KWH User can be reset using the button below.

Volume Used displays the current flow out the booster, Gallons X1000 that has pumped from the booster and the Gallons user X1000 that has pumped from the booster. The User Gallons can be reset using the button below.

Tank level information including current tank level in inches, gallons of water in the tank and the settings to stop and resume booster pump operation based on tank levels.

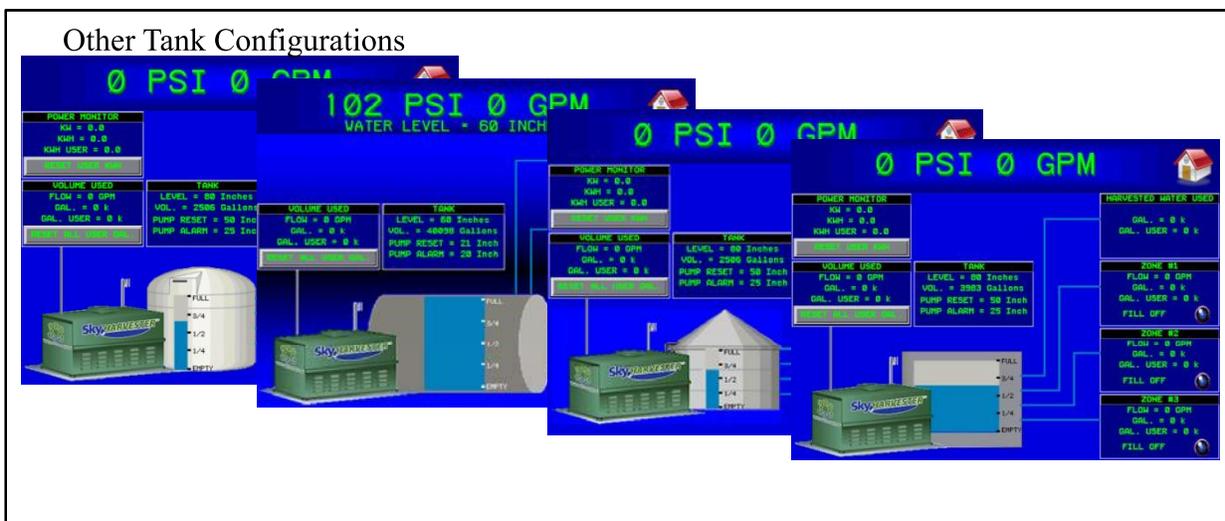
Touching the Pump graphic will bring up the Pump Screen. Touching the Tank graphic will bring up the Level Setting Screen. Current Water level will be displayed in the tank.



Harvested Water Used GAL. - The amount of flow produced using runoff or rainwater since shipment from the manufacturer. GAL USER. - The amount of flow produced using runoff or rainwater since the last time it was reset using the button to the left.

Display for up to three fill zones. Each zone can deliver water to the tank if runoff or rainwater cannot satisfy the tank level. Each zone displays the current flow coming from the zone, zone running status, Gallons X1000 that has pumped from the zone and the Gallons user X1000 that has pumped from the zone. The User Gallons can be reset using the button to the left.

By pressing the title bar in each zone the name of the zone can be changed. By pressing the display the level set points for each zone can be changed. See the Water Level screen for more details.



Pump Screen

Representation of a vertical turbine style station

Press individual pump images to see the elapsed motor runtime hours and pump capacities.



Pump Status - Running/OFF



Pump/Motor Control- Indication of the position of the electronics butterfly valve and/or the speed of the variable frequency drive. If the control type is not used the display will not be present.

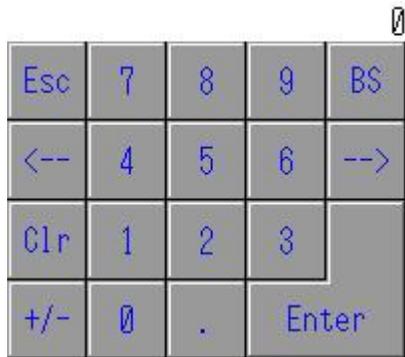
The Enabled-Disabled box displays the pump status. If the pump is "Enabled" the pump can be run automatically by the system to supply water for the current demand. If the pump is "Disabled" the pump is not in auto mode via the HOA switch, the pump is alarmed or the pump is locked out by a remote signal.

Representation of a horizontal centrifugal style station



System Screen

User Password-Key in 546
then press Enter



Current Regulate - This display is real-time displaying the pressure the pump system is trying to maintain independent of outgoing flow. As the system is pressurizing this value is less than the user entered regulate set point.

Press to display the Option Menu

Regulate Setting - This display is real-time displaying the entered regulate set point.

“System Status O.K. – Displayed when the system has reached the Final Regulate set point. If “Pressurizing System” is displayed then the Current Regulate is less than the Final Regulate.

Restarts Remaining - Displays the number of times the pump station will attempt to reset current alarms before a final shutdown. When the display reads 0 the pump station will shutdown until the user presses the red reset button located on the control panel.

Settings Menu

The following buttons will display screens used by service technicians to calibrate the pumping system. Changing any parameters in the following screens may have an adverse effect on the system. Please see service documents for the following:

- Pump No.X Configuration
- Program Configuration
- Change a Register
- Analog Configuration
- Pulse Configuration

Press to adjust Pressure Regulate Settings

Press to set the Time and Date or configure Screen settings.

Used to manually run the VFD at a fixed speed. Used for service ONLY.

Caution: *If in Manual mode the pump station will not regulate system pressure with changing flow demands.*

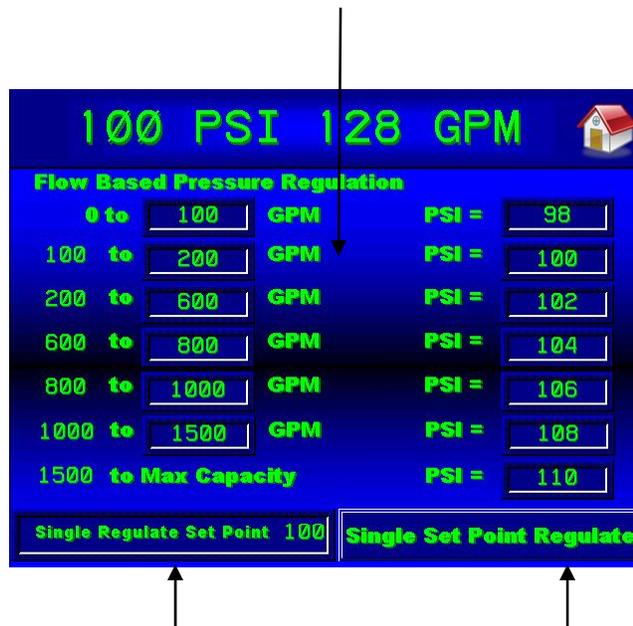


Note: Changes made at this level can have a negative effect on the pump system. This screen is to be used by qualified technicians or in conference with Watertronics.

Regulate Settings

Two modes are available Single Set Point Regulation and Flow Based Regulation. Single Set Point Regulation mode provides constant pressure to the irrigation system regardless of flow. Flow Based Pressure Regulation provides a means to ramp up the pump station discharge pressure as the flow increases to overcome increasing friction losses. Supplying only the required sprinkler design pressure saves energy.

Flow Based Pressure Regulation Settings.
(Please see the Data Entry screen in this section for use of the data keypad)



Note: Pressure regulate difference between consecutive set points should not exceed 3 PSI.



Single Set Point Regulation Setting.
(Please see the Data Entry screen in this section for use of the data keypad)

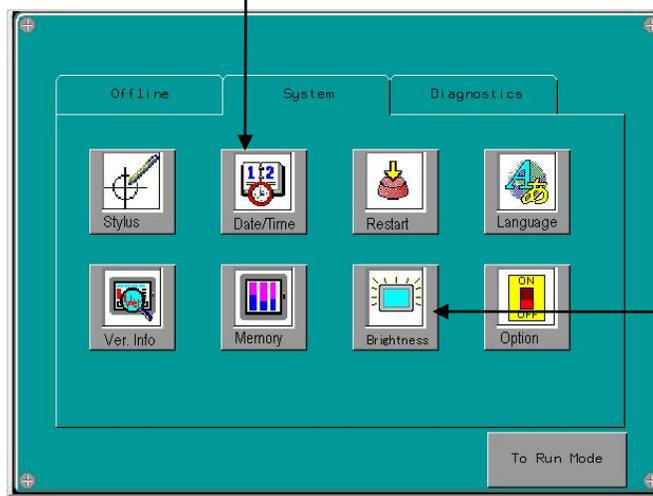
The Single Set Point / Flow Based Pressure Regulation button toggles between regulate modes.

Screen Settings



Note: Changes made at this level can have a negative effect on the pump system. Do NOT make changes to any other settings other then described below.

Touch to set the time and date.



Touch to adjust screen colors.

Press to return to Virtual Vision

Time Of Use Lockout



Note: Changes made at this level can have a negative effect on the pump system.

Up to three different lockout configurations can be setup. Use this button to toggle between the groups.

Allow the user to select the devices to disable for the configured times and days to the left. Note: All devices may not be listed for each pump station. Active devices are highlighted in red.

Allows the user to set the lock, unlock times and days of the week to disable devices selected to the right. Active days are highlighted in red.

Lockout Group #1	PUMP NO.1	PUMP NO.2	PUMP NO.3
LOCK TIME	PUMP NO.4	PUMP NO.5	PUMP NO.6
07:00	PUMP NO.7	PUMP NO.8	PUMP NO.9
UNLOCK TIME	PUMP NO.10	PUMP NO.11	PUMP NO.12
23:00	SUSTAIN PUMP	A.C.D. NO.1	A.C.D. NO.2
SUNDAY	LOCK PSI #1		
MONDAY	FILL PUMP #1	FILL PUMP #2	FILL PUMP #3
TUESDAY	FILL PUMP #4	FILL PUMP #5	FILL PUMP #6
WEDNESDAY	CHEMICAL #1	CHEMICAL #2	CHEMICAL #3
THURSDAY	CHEMICAL #4	CHEMICAL #5	CHEMICAL #6
FRIDAY	CHEMICAL #7	CHEMICAL #8	
SATURDAY	LOCKOUT ENABLED	EXIT	

← Exit Button - This button will return you to the Setting Menu screen.

Disables and enables the selected lockout group. If disabled the lockout times will be ignored.

Flow Screen

Note: Screen may not be present with all pumping systems.

Total Gallons X 1000 is the amount of flow produced by the system since shipment from the manufacturer.

Total Gallons X 1000 (User#1) is the amount of flow produced since the last time it was reset using the button to the right.

Total Gallons X 1000 (User#2) is the amount of flow produced since the last time it was reset using the button to the right.

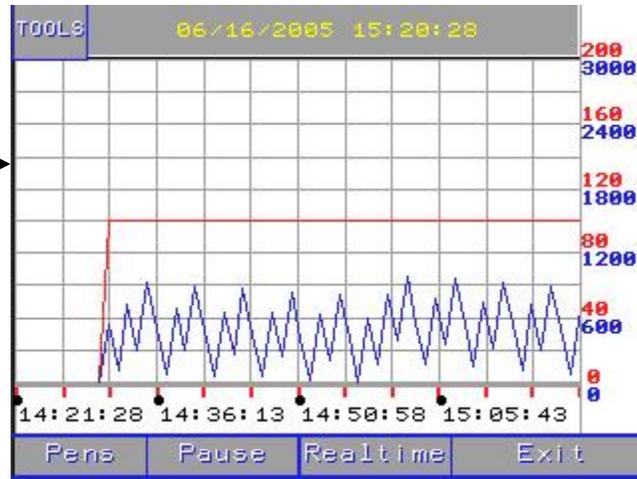


The Reset Gallons button will reset the User#1 display to 0.

The Reset Gallons button will reset the User#2 display to 0.

1 Hour Graph

Press to return to the Graph Tools.



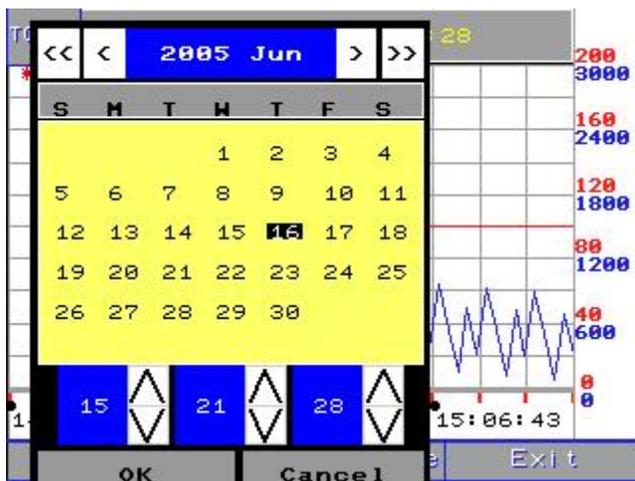
Returns the display to the Menu Screen

Press to show pen descriptions.

Puts the Graph in Historic mode.

Puts the Graph in Real time mode.

Graph Area - The Red line represent Pressure in PSI, the Blue line represents Flow in GPM.



Alarm Screen



Used to navigate through the alarm pages.



Will clear the alarm log but does not reset active alarms.



Will acknowledge logged alarms but does not reset active alarms or clear them from the log.

Event	Date	Time	State
High Pressure Alarm	05/01/2008	09:49:28	ACTIVE
Pipe Fill Alarm	05/01/2008	09:49:30	ACTIVE
Pipe Fill Alarm	05/01/2008	09:49:33	RTN

At the time an alarm become active it will be displayed in this window in red. When the alarm is reset the alarm description will be recorded in green.

Active Alarms: Displays will be visible when active alarm are present To reset active alarms press the red reset button located on the control panel door.

Water Level Screen

Available when the secondary water source fills the tank

Note: Options may not be present on all pumping systems.

Water level is displayed in real-time in a numeric format.

When the Low Level Alarm is present and the Water Level rises above this setting the Low Level Alarm will be reset. (Please see the Data Entry Item in this section for use of the data keypad).



If the Water Level falls below the Low Level Alarm setting the pump station will indicate an Alarm in the status bar and retire any configured pumps. (Please see the Data Entry Item in this section for use of the data keypad).

The Water Level Control Settings button is present when the system is configured to transfer water from one location to another. Press to go to the Fill Configuration Screen.

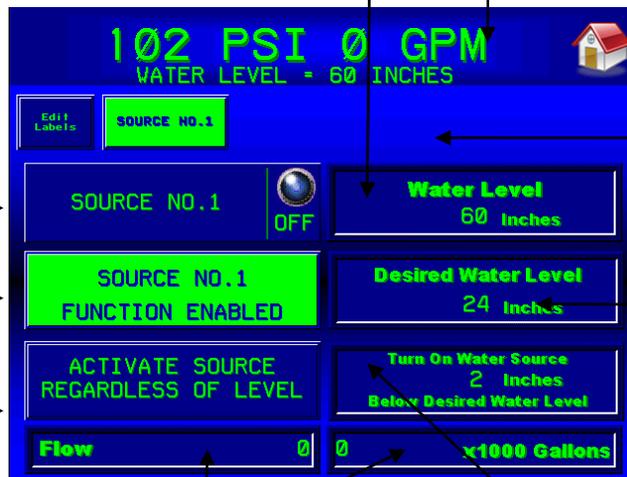
Water level is displayed in real-time in a numeric format.

Running indication for the selected transfer pump.

The transfer operation can be disabled/enabled with the FILL AUTO FUNCTION button.

The user can force the transfer with the FILL OVERRIDE button.

Caution: *The fill supply will remain on independent of water level until the button is pressed again.*



If more than one Water Level Control device is configured, select device by pressing the selection buttons. The current selection is highlighted green.

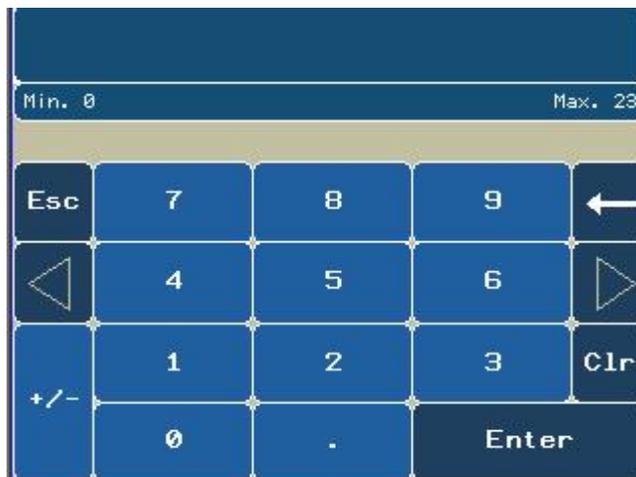
The Set Point is the level (in inches) the fill supply will maintain. (Please see the Data Entry Item in this section for use of the data keypad).

When the fill is supplied with a flow meter the real-time flow and the historic gallons pumped will be displayed.

The Window is the deviation from the set point to start the fill pump (Set Point – Window). When the level reaches the Set Point the fill pump will stop. (Please see the Data Entry Item in this section for use of the data keypad)

Data Entry Keypad

Any time a data entry field is pressed a keypad will appear allowing the user to enter numeric data. To enter a new value, using the numbered keypad, touch in a new value between the Maximum and Minimum limits. The Backspace key may be used at any time to change your entered value. When the proper value is entered the Enter key must be pressed to load the value into the PLC's memory.



MAINTENANCE PROCEDURES

For details and specifications about your Pump Station components, consult the information provided in Section Five of this Manual. These manuals are supplied by the manufactures of the individual components used to build your pumping system. It is important that you read and understand the different requirements of each one of these components to ensure efficient, trouble-free system operation.

The most common components needing routine maintenance include:

- **Pressure Relief Valve (PRV)**
- **Pumps**
- **Motors**
- **Filter Systems**

THE PANASONIC PLC

Overview & Operating Principle Panasonic Sigma PLC

The Panasonic Sigma Programmable Logic Controller supplied with this pump station monitors & processes information such as flow and pressure data to provide output for start/stop/sequencing of system pumping operations. Additional functions include data logging and system diagnostic capabilities. Controller, I/O, power supply & communications functions are in a compact, integrated package mounted within the control enclosure.

Referring to the image of the PLC in Figure 1, the 24VDC power is brought into the PLC on the bottom of the PLC housing. The discrete inputs (selector switches, pushbuttons, temp. Sensors, etc) are wired to the PLC's top din connectors labeled with an (X). The discrete outputs (indicator lights, motor starters, electric butterfly valves (EBV's) etc.) are wired to the PLC's top din connectors labeled with an (Y). Additional I/O required will be in the form of expansion card that will reside along either side of the PLC.

The communication ports -- com 1 and com 2 are located on the bottom side of the unit. These communication ports will be used for connecting to the PLC with software packages like Watervision.

THE PANASONIC CHECK OUT PROCEDURE



1. **CAUTION!** Before entering the electrical control enclosure to inspect the PLC, ensure that door-mounted Main Disconnect Switch is in the OFF position.
2. **IMPORTANT!** Ensure that the “black” din connector terminal blocks are securely attached to the PLC. Each block is attached to the PLC base via two clips located at the top. See Figure 1.



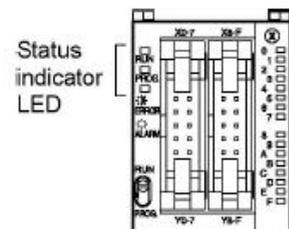
Exercise EXTREME CAUTION for the following steps require Power be applied to the enclosure while the door is open.

3. With the Station control power ON, check status display panel located on front of the PLC. Light-emitting diodes (LED) indicate health and status of the CPU, battery, communication ports & fixed I/O points. LEDs on the left side of the unit indicate the following status:

Status indicator LEDs on control unit

	LED status			Description	Operation status
	RUN	PROG.	ERROR/ALARM		
Normal condition	Light (on)	Off	Off	Normal operation	Operation
	Off	Light (on)	Off	PROG. mode	Stop
	Flashes	Flashes	Off	Forcing on/off in Run mode	Operation
Abnormal condition	Light (on)	Off	Flashes	When a self-diagnostic error occurs	Operation
	Off	Light (on)	Flashes	Shen a self-diagnostic error occurs	Stop
	—	—	Light (on)	System watchdog timer has been activated	Stop

- The control unit has a self-diagnostic function which identifies errors and stops operation if necessary.
- When an error occurs, the status of the status indicator LEDs on the control unit vary, as shown in the table above.



- **COM 1**
A “flashing” GREEN LED indicates that com port #1 is active and communicating with an external device.
- **COM 2**
A “flashing” GREEN LED indicates that com port #2 is active and communicating with an external device.

THE PANASONIC CHECK OUT PROCEDURE

(Continued...Page 2 of 2)

4. The Panasonic Sigma Programmable Logic Controller supplied with this Pump Station has been programmed at the factory to meet specific requirements, and therefore does not require additional user input. However, changes to system settings such as regulate set point, VFD/EBV operation, etc. can be made through the display unit (See Section Three - Tab 7).
5. If the user wants to become more familiar with PLC operation, installation, or specifications, the Sigma User Manual (see Section Five -Tab 26) provides detailed information about the unit.

Figure 1:



THE VARIABLE FREQUENCY DRIVE (VFD)

Overview & Operating Principle Variable Frequency Drive

Check Out Procedure Variable Frequency Drive

1. With the pump system under power, VFD status will be displayed by LEDs located within the digital operator portion of the unit. Status displays include:
 - **DRIVE**
Lights when the VFD is in DRIVE mode of operation.
 - **FWD**
Lights when FORWARD has been selected. NOTE: The VFD installed in this pump station has been programmed to run in FWD only.
 - **REMOTE**
Lights when the VFD is programmed to operate from an external control.
 - **SEQ**
RUN & STOP signals.
 - **RUN**
Lights steadily when RUN signal is active; blinks after STOP signal has been received & VFD output is ramping down. Not lit when VFD is in the stopped condition.
 - **STOP**
Lights steadily at initial power-up; blinks after RUN signal is active but motor frequency reference is zero. Not lit when the VFD is controlling the speed.
2. The VFD supplied with this Pump Stations has been programmed at the factory to meet specific system requirements, and therefore does not require additional user input.
3. If the user wants to become more familiar with keypad functions & additional features, the VFD Technical Manual (see Section Five Tab - 19) provides detailed information about the unit.

PUMP STATION WINTERIZATION PROCEDURE

This winter shut down procedure should be performed at the same time as the irrigation system is blown out. To prevent damage to the Pump Station or its components, ensure that each of the following steps are complete:

- Turn off Panel and the Main Disconnect power to the control panel. If a remote disconnect feeding the control panel is accessible shut it off also. Lock any disconnect with a padlock to ensure power cannot be applied unintentionally.
- Drain all manifolds completely of water including any supply lines. When the system is drained Close the Isolation Valve to eliminate any remote source from feeding water into the pump system. Leave all drain valves open though the winter.
- Remove the Pressure Sensor wire by removing the keeper screw located below the liquid-filled gauge on the discharge manifold. Remove the Pressure Sensor unit by unthreading it from the T-fitting and store in a location where it would not be subjected to freezing. Damage will occur if the sensor is exposed to temperatures below 32 degrees F.
- Loosen any fittings on the Pressure Relief Valve (PRV) which may hold water, then flush both the Pilot and the Main Valve with a 50/50 solution of water and Environmentally Safe Antifreeze.
- Open the Petcocks at the bottom of each Check Valve or adjacent piping.
- Open the Drain Valve at the bottom of the pressure tank (if applicable).
- Install new corrosion inhibitors in the Electrical Control Panel.
- Manually open each EBV approximately half way (see Section Five Tab – 18).
NOTE: Control Panel power must be OFF or else the EBV's will close automatically. It will not be necessary to manually close valves in spring, since they will close automatically when power is re-applied.
- Remove any piping including suction lines, which will remain in any standing water over the winter months.
- Drain all standing water from pump cases by removing plug, opening valves, loosening bolt, ext. (see Section Five Tab – 28) for specific pump configurations and draining steps.

RECOMMENDED SPARE PARTS LIST

ITEM NO.	DESCRIPTION	QUANTITY (each)
1)	Motor fuse(s)	3 (per motor)
2)	Control Transformer Primary Fuse	2
3)	Control Transformer Secondary Fuse	2
4)	PLC I/O Fuse (glass slo-blow)	4
5)	Corrosion Inhibitor	2
6)	Pump Seals (optional)	1(each pump)
7)	Pump Packing Gland (if applicable)	1(each pump)
8)	Flow Sensor	1
9)	Pressure sensor	1
10)	PRV Pilot Rebuild Kit	1
11)	PRV Y-Strainer Screen	1
12)	Lightning Protection	1
13)	Assorted Flange and Pump Gaskets	1 of Each

TROUBLESHOOTING GUIDE

--- WARNING !! ---



This equipment contains **LIFE THREATENING VOLTAGES**. Exercise **EXTREME CAUTION** when working on or near this part of the station. Never open the electrical enclosure until you have **TURNED OFF** all power to the station.



NOTE: When checking fuses for continuity, make sure that **ALL** power is **OFF**. If the fuses are good, check the electrical power for **CORRECT** Voltage Levels before replacing suspected bad components. Since this must be done with power **ON**, exercise **EXTREME CAUTION**.

(1) -----

SYMPTOM: Pressure Display Remains at One Reading (and/or above 200 PSI) on the Display

PROBABLE CAUSE:

The Pressure sensor is not Connected at the Terminal Strip or is unplugged.

CORRECTIVE ACTION:

Check for loose or unplugged wires and repair.

The Pressure sensor has FROZEN and Failed.

Replace PRESSURE SENSOR.

(2) -----

SYMPTOM: Pumps will NOT come on in AUTO mode -- even though The Pressure in the system is LOW.

PROBABLE CAUSE:

Low Pressure Alarm Condition exists.

CORRECTIVE ACTION:

Check for Cause(s) of LOW PRESSURE Alarm and correct.

The Pressure Reading on the Display is not Accurate.

Calibrate the Pressure Display to match the Liquid-Filled Gauge.

Troubleshooting Guide

(Continued...Page 2 of 5)

(3) -----

SYMPTOM: Pumps will NOT run in either MANUAL or AUTO.

PROBABLE CAUSE:

No Power at Pump Motor(s).

Phase Monitor NOT on.

Duplex Outlet/GFCI Tripped.

An Overload Relay has tripped.

Blown Motor Fuse(s)

Blown Transformer Primary, or
Secondary Fuse(s).

CORRECTIVE ACTION:

Turn ON Main Power. Turn ON Panel Power.

Ensure Correct Phase & Voltage Level.

Press RESET on GFCI Unit.

Check OVERLOAD Relays. RESET if Tripped.

Replace FUSE(s).

Check for loose wires or shorted wires and
Replace FUSE(s).

(4) -----

SYMPTOM: Pumps run in AUTO mode, but do not SHUT-OFF,
And/Or, Continuously Cycle ON & OFF.

PROBABLE CAUSE:

Irrigation System is
Demanding Water.

The Flow Reading on the
Display is not Accurate.

The Flow Sensor is Defective.

The Pressure Relief Valve (PRV)
is Leaking or needs Adjustment.

CORRECTIVE ACTION:

Check for open sprinkler heads, stuck valves,
or broken pipes in the system.

Re-calibrate the FLOW Display.

Replace SENSOR if unable to Calibrate Flow
or, if Green LED (on term. Strip) does NOT
Flash when water is flowing in the System.

Check the PRV. Clean and Adjust as Required.

Troubleshooting Guide

(Continued...Page 3 of 5)

(5) -----

SYMPTOM: Pump runs in AUTO mode, but ALARMS.

PROBABLE CAUSE:

Alarm Condition -- Low/High Pressure, etc...

The Electronic Butterfly Valve (EBV) did not open.

Tripped Motor Overload Relay.

CORRECTIVE ACTION:

Correct & Clear Alarm Condition.

Check for proper operation of EBV's.

Check & RESET Overload(s).

(6) -----

SYMPTOM: The Electronic Butterfly Valve(s) -- EBV's -- will NOT Open or Close.

PROBABLE CAUSE:

There is a Blown Fuse on a PLC output driving an EBV.

The Pressure sensor is Defective.

Defective Butterfly Valve(s)

Defective Electric Actuator(s).

CORRECTIVE ACTION:

Check Output FUSE(s) and Replace.

Test & Replace PRESSURE SENSOR.

Check to see if EBV will OPEN Manually.

Remove the Actuator Cover and inspect for:
Loose Wires,
Loose/broken RC Snubbers,
Stripped/Broken gears,
Loose/Broken Brake Wheel assembly.

Troubleshooting Guide

(Continued...Page 4 of 5)

(7) -----

SYMPTOM: Excessively HIGH Pressure Develops Before the Station Shuts-Down (High Pressure Alarm).

PROBABLE CAUSE:

There is a defective, dirty, or Misadjusted Pressure Relief Valve

The Pressure sensor is Disconnected or Defective.

EBV(s) not functioning properly.

The Pressure Display Needs Calibration.

CORRECTIVE ACTION:

Clean, adjust or repair as required.

Test & Replace PRESSURE SENSOR.

Test each EBV for correct operation. Repair or Replace EBV(s) as required. (see SYMPTOM #6)

Re-calibrate Pressure Display to match The Reading on the Liquid-filled gauge.

(8) -----

-SYMPTOM: The Station Alarms on LOW PRESSURE ALARM.

PROBABLE CAUSE:

Irrigation system is demanding water Beyond Station's Capacity.

A Pump(s) is NOT coming ON when called for by PLC.

One, or more, EBV is NOT Opening when directed to by the PLC.

The Pressure sensor is Defective.

CORRECTIVE ACTION:

If number of sprinkler heads ON exceeds Capacity, Change Program accordingly.

Check for a TRIPPED Overload or a BLOWN Fuse(s). RESET or REPLACE as Required.

Check & Correct OPERATION of EBV(s) or Electric Actuators (see SYMPTOM #6).

Test & Replace PRESSURE SENSOR.

Troubleshooting Guide

(Continued...Page 5 of 5)

(9) -----

SYMPTOM: The Pumps lose PRIME (HC Model Systems Only).

PROBABLE CAUSE:

The Positive Prime is plugged or shut-off.

A significant leak exists in the Suction Line.

The suction line Foot Valve is leaking.

A Petcock on the Volute Case may be open.

There may be a defective Pump Mechanical Seal.

CORRECTIVE ACTION:

Clear obstruction, or open the Positive Prime Valve if it is shut-off.

Repair the leak in the line.

Repair, or replace Foot Valve.

Close the Petcock.

Repair/Replace the defective SEAL.

(10) -----

SYMPTOM: The Station Alarms on HIGH TEMPERATURE.

PROBABLE CAUSE:

The Water Temperature of the Pump Inlet is above 120 degrees.

Defective Temperature Sensor.

CORRECTIVE ACTION:

Check for Loss of PRIME; or for a LEAK in The Suction Line.

Replace TEMPERATURE SENSOR.

VpCI®-111 Emitter, Patented



PRODUCT DESCRIPTION

VpCI-111 emitters are unique devices designed to provide corrosion protection for metal components and parts enclosed in non-ventilated control boxes, cabinets or tool boxes up to 11 cubic feet (312 liters). The Vapor phase Corrosion Inhibitor (VpCI) emit vapors, which form a molecular layer on internal metal surfaces to protect critical, complex, and expensive electronic equipment during operation, shipping, or storage. VpCI-111 is a small patented plastic emitter with a breathable Tyvek® membrane through which corrosion inhibitors are slowly released. VpCI-111 provides long term protection against corrosion even in the presence of adverse conditions including salt, moisture, airborne contaminants, H₂S, SO₂, NH₃, and others.

TYPICAL APPLICATIONS

- Operating, packaged, and stored electrical equipment
- Marine navigation and communication equipment
- Aerospace electrical controls

- Electric motors
- Switching equipment
- Fuse boxes and power boxes
- Medical equipment
- Electrical wireways and terminal boxes
- Scientific and measuring instruments
- Telecommunications equipment and remote electronics devices

FEATURES

- Economical to use
- Provides continuous protection for up to 24 months during operation and/or shutdown
- Effective in polluted and humid environments
- Does not interfere with electrical, optical, or mechanical performance
- Contains desiccant properties
- Multimetal protection
- Quick and easy installation
- Very convenient to install
- Non-toxic and safe to handle
- Compact and space-saving
- Free of nitrites, halogens, and phosphates
- No spraying, wiping, or dipping required
- VOC values meet Southern California Clean Air Act and other National and local regulations
- Self-stick back
- Self-stick date label
- NSN# 6850-01-408-9025
- Accepted by FDA for corrosion protection of electrical and electronic equipment within food processing plants
- Canadian Food Inspection Agency acceptance for indirect food contact
- Approved for U.S. military and NATO
- Conforms to MIL I-22110C

METHOD OF APPLICATION

VpCI-111 is extremely simple and convenient to install. VpCI-111 emitters should be installed as early as possible, preferably during manufacturing or assembly. Simply select a space within enclosed device where corrosion protection would be useful. Verify that the surface on which the device will be installed is clean and free of debris. Peel off the protective peel strip from the bottom of the device and attach it to the clean surface. The peel strip can be separated to reveal a self-adhesive sticker on which the installation and replacement dates can be noted. VpCI-111 emitters can be installed in any position. For volumes greater than 11ft³ (312 L), install more than one VpCI-111. If the enclosure is not totally air-tight or if the access doors are opened frequently, replace the VpCI®-111 emitter more often than every two years. After periods of heavy maintenance, replace the emitter. For additional protection spray the enclosure very lightly with ElectriCorr® VpCI-238.

PROPERTIES

Appearance	Green cup with Tyvek®lid
Protection	11 ft ³ (312 Liters) / emitter
Standard size	Plastic device cup with breathable membrane 2.25 in. diameter x 1.27 in. H (5.7 cm x 3.2 cm)

PACKAGING AND STORAGE

Product should not be exposed to temperatures of over 185°F (85°C). VpCI-111 is available in 10 individually wrapped emitters per carton.

FOR INDUSTRIAL USE ONLY

KEEP OUT OF REACH OF CHILDREN

KEEP CONTAINER TIGHTLY SEALED

NOT FOR INTERNAL CONSUMPTION

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

LIMITED WARRANTY

All statements, technical information and recommendations contained herein are based on tests Cortec Corporation believes to be reliable, but the accuracy or completeness thereof is not guaranteed.

Cortec Corporation warrants Cortec® products will be free from defects when shipped to customer. Cortec Corporation's obligation under this warranty shall be limited to replacement of product that proves to be defective. To obtain replacement product under this warranty, the customer must notify Cortec Corporation of the claimed defect within six months after shipment of product to customer. All freight charges for replacement products shall be paid by customer.

Cortec Corporation shall have no liability for any injury, loss or damage arising out of the use of or the inability to use the products.

BEFORE USING, USER SHALL DETERMINE THE SUITABILITY OF THE PRODUCT FOR ITS INTENDED USE, AND USER ASSUMES ALL RISK AND LIABILITY WHATSOEVER IN CONNECTION THEREWITH. No representation or recommendation not contained herein shall have any force or effect unless in a written document signed by an officer of Cortec Corporation.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE. IN NO CASE SHALL CORTEC CORPORATION BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.



4119 White Bear Parkway, St. Paul, MN 55110 USA
Phone (651) 429-1100, Fax (651) 429-1122
Toll Free (800) 4-CORTEC, E-mail info@cortecvci.com
Internet <http://www.CortecVCI.com>

Distributed by:

printed on recycled paper  100% post consumer
Revised 3/3/09. Cortec Corporation 2001-2009. All rights reserved. Supersedes: 5/23/06.
ElectriCorr® is a trademark of Cortec Corporation
Tyvek® is a registered trademark of E.I. DuPont de Nemours and Company.
© 2009, Cortec Corporation. All Rights Reserved. Copying of these materials in any form without the written authorization of Cortec Corporation is strictly prohibited.



Badger Meter

Series 228

Metallic Tee and Small Pipe Tee Type Flow Sensors

OVERVIEW

The Data Industrial Series 228 flow sensors from Badger Meter feature a six bladed impeller design with a proprietary non-magnetic sensing mechanism. The forward swept impeller shape provides higher, more consistent torque than four bladed impeller designs and is less prone to be fouled by water borne debris. The forward curved shape coupled with the absence of magnetic drag provides improved operation and repeatability even at lower flow rates. This is especially true where the impeller is exposed to metallic or rust particles found in steel or iron pipes. As the liquid flow turns the impeller, a low impedance square wave signal is transmitted with a frequency proportional to the flow rate. The signal can travel up to 2,000 feet between the flow sensor and the display unit without the need for amplification. All sensors except irrigation versions are supplied with 20 feet of 2-conductor 20 AWG shielded UL type PTLC 105°C cable.

SERIES 228 TEE SENSORS

The tee mounted flow sensors consist of a standard 220BR or 220SS mounted in a 2 inch or 2.5 inch tee.

- Model 228BR brass/bronze sensor mounted in a bronze tee
- Model 228SS stainless steel sensor mounted in a stainless steel tee
- Model 228CB brass/bronze sensor mounted in a cast iron tee.



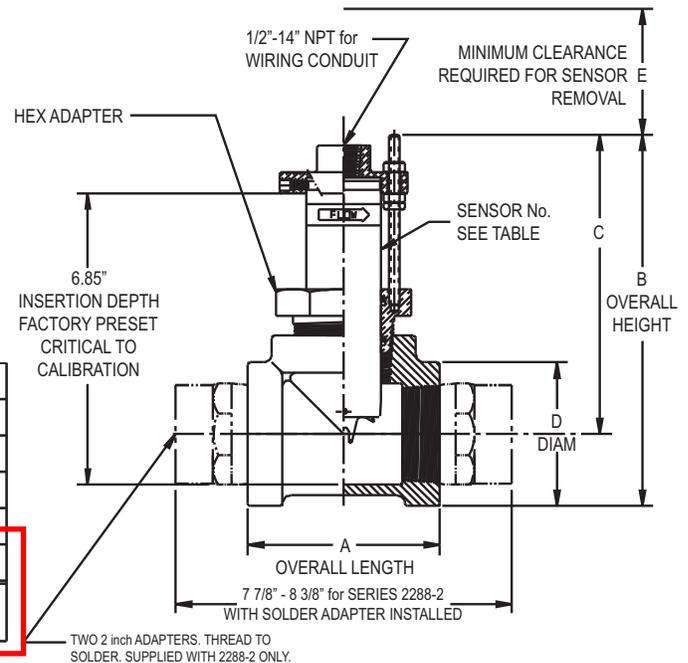
		Example: 2 28 BR 20 0 5 - 1 2 1 1													
STYLE	Tee Mounted Insert Sensor	28													
MATERIAL	Brass (2" and 2.5" Only)		BR												
SIZE	2"			20											
	2.5"			25											
ELECTRONICS HOUSING	PPS				0										
ELECTRONICS	CSA Approved								4						
	Standard Flow (STANDARD)								5						
	IR-Irrigation								6						
	High Temperature								8						
O-RING	Viton®												0		
	EPDM (STANDARD)												1		
	Buna N												8		
SHAFT	Zirconia Ceramic													0	
	Tungsten Carbide (STANDARD)													2	
	316 Stainless Steel													6	
IMPELLER	Nylon (STANDARD)														1
	Tefzel®														2
BEARING	UHMWPE (STANDARD)														1
	Tefzel®														2
	Teflon®														3

Series 228 Metal Tee Sensors Ordering Matrix (2" to 2-1/2")
(See Series 250 for pipe sizes 1/2" to 1-1/2")

SPECIFICATIONS

Wetted Materials (except tees)	See ordering matrix
Sensor Sleeve and Hex Adapter for 228BR, 228CB	Sleeve: admiralty brass, UNS C44300; Hex Adapter: valve bronze, UNS C83600
Sensor Sleeve and Hex Adapter for 228SS and 228CS	Series 300 stainless steel
Tee for 228BR	Cast bronze, Class 125 per ASME B16.4
Tee for 228SS	Cast 316 stainless, Class 150
Tee for 228CB	Cast iron, Class 125 per ASME B16.4
Temperature Ratings	Standard Version: 221°F (105°C) continuous service; Irrigation Version: 150°F (66°C) continuous service
Pressure at 100°F	228B: 200psi; 228CB: 175 psi; 228SS: 300 psi
Recommended Design Flow Range	0.5 to 30 ft/sec for 228
Accuracy	±1.0% of full scale over recommended design flow range
Repeatability	±0.3% of full scale over recommended design flow range for 228
Linearity	±0.2% of full scale over recommended design flow range for 228
Transducer Excitation	
Quiescent Current	600µA at 8V DC to 35V DC max.
Quiescent Voltage	(V _{High})
Supply Voltage	600µA * supply impedance
ON State (V _{Low}) Max.	1.2V DC at 40mA current limit (15 Ω + 0.7V DC)
Electrical Cable for Standard Sensor Electronics	20 feet of 2-conductor 20 AWG shielded UL type PTL wire provided for connection to display or analog transmitter unit. Rated to 105°C. May be extended to a maximum of 2000 feet with similar cable and insulation appropriate for application.
Electrical Cable for IR Sensor Electronics	48 inches of UL Style 116666 copper solid AWG 18 wire with direct burial insulation. Rated to 105°C.

228CB-2.5	SEE MATRIX	71881T	2.5-8	4.98	9	7	4	6
228BR-2.5	SEE MATRIX	71883T	2.5-8	4.75	8.78	7	3.56	6
228SS-2	SEE MATRIX	711338T	2.11-8	4.5	5.38	5.88	3	6
228CS-2	SEE MATRIX	71876T	2.11-8	4.5	8.57	5.88	3.38	6
228CB-2	SEE MATRIX	71876T	2.11-8	4.5	8.57	5.88	3.38	6
228BR-2	SEE MATRIX	71879T	2.11-8	4.25	8.35	5.88	2.94	6
SERIES No. COMPLETE	SENSOR No.	TEE No.	NPT	A	B	C	D	E



NOTE - DIMENSIONS "B" AND "C" MAY VARY +/- 1/4 inch. DEPENDING UPON MAKE-UP ON PIPE THREADS>



Please see our website at www.badgermeter.com for specific contacts.

www.badgermeter.com

Data Industrial® is a registered trademark of Badger Meter, Inc.

Other trademarks appearing in this document are the property of their respective entities.

Due to continuous research, product improvements and enhancements, Badger Meter reserves the right to change product or system specifications without notice, except to the extent an outstanding contractual obligation exists. © 2012 Badger Meter, Inc. All rights reserved.

Badger Meter | PO Box 245036, Milwaukee, Wisconsin 53224-9536 | 800-876-3837 | infocentral@badgermeter.com

DW Series



Reclaimed Water Irrigation Valves



- **Ideal For Use With Reclaimed Or “Dirty” Water**
- **Self-Cleaning ~ No Filters or Screens to Clean or Replace**
- **Slow-Closing and Opening ~ No Pipe-Damaging Water Hammer**
- **Long Lasting Bronze Construction, Five Year Warranty**

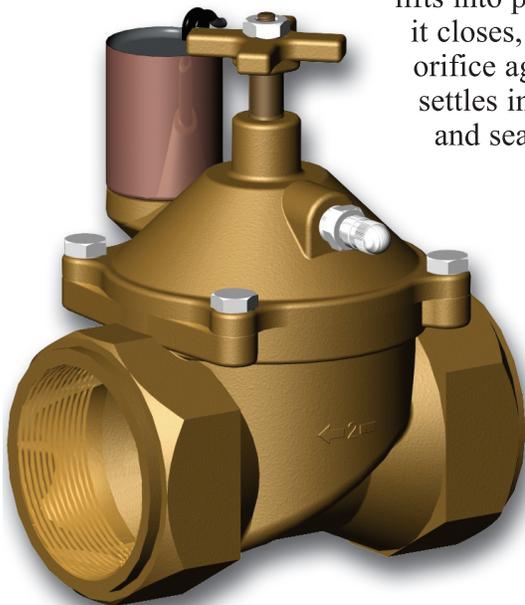
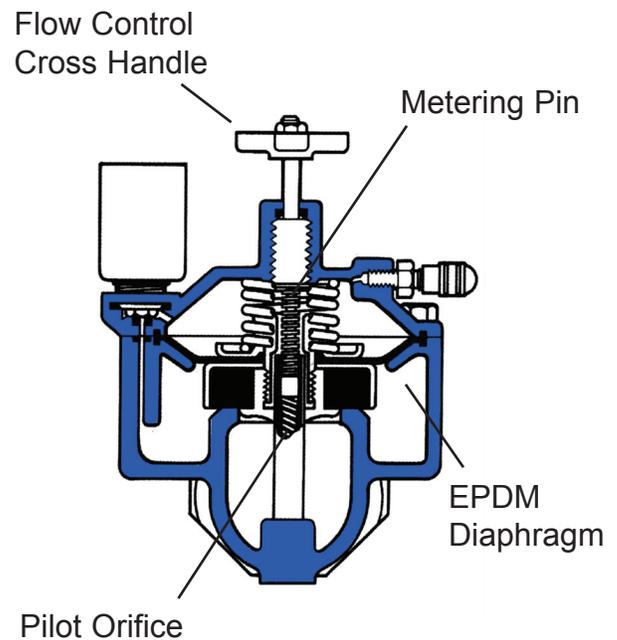
Your best choice for maximum irrigation performance is Griswold Controls DW Series valve. The DW Series valve, similar to the more advanced 2000 Series valve, has numerous integrated features.

- *Unique diaphragm* made of a special EPDM material. The unique design of the valve with this material assures long life.
- *Griswold's “slow to open – slow to shut” feature* providing the ultimate in controllability. The possibility of system failures or breaks are minimized by reducing pressure surges or “water hammering”. Slowing the opening and closing force of a valve reduces water hammer and long term wear and fatigue on plastic irrigation pipes, joints, couplings and sprinkler heads.
- *Self cleaning design without filters and screens* in an industrial quality body. Most foreign elements found in reclaimed or pumped water will pass through the valve without any problem and will not accumulate. The pilot orifice is kept clean by the opening and closing action of the valve. When it is opened, for example, the disc assembly simply wipes the orifice clean as it lifts into position. When it closes, it wipes the orifice again as it settles into its seat and seals closed.

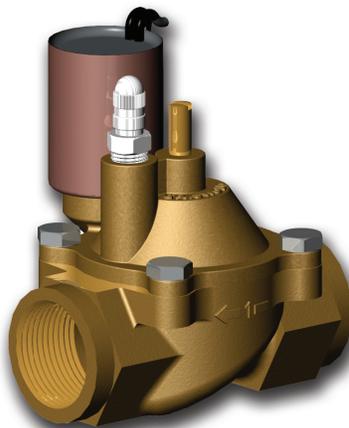
These features make the DW Series ideal for:

- *Residential and Commercial Landscapes*
- *Municipal landscapes and parks*
- *Schools and universities landscapes*
- *Golf courses*
- *Hospitality Industry landscapes*

Opening and Closing Speed Control Components



Model DWS





- **Heavy Duty Machined Bronze Construction ~ No Plastic Components Used**
- **Adjustable Downstream Pressure Control**
- **Internal Manual Bleed**
- **Stainless Steel Schraeder Valve for Easy Pressure Gauge Connection**

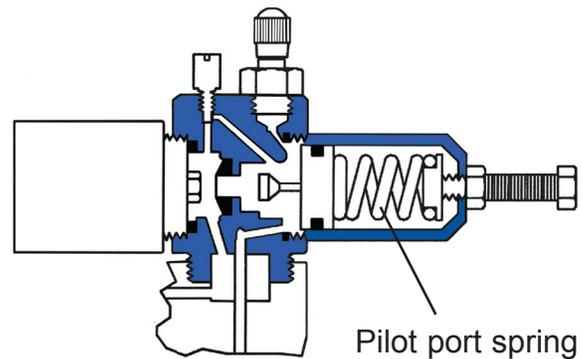
The DW-PRV Pressure Reducing Valve adds downstream pressure regulation as an important feature for optimum irrigation flow control. Steady controlled flow is the key to proper pressure regulation.

• *The Forward-Flowing design* of Griswold Controls valves ensures the maintenance of constant downstream pressure. The DW-PRV provides pressure independent steady water flow, independent of variations or pulsations in the main water supply. The valves can regulate the pressure to any value between 5 and 125 psi with the simple adjustment of a screw. The constant pressure supplied by the upstream water against the bottom of the diaphragm assembly guarantees a smooth regulation of downstream pressure.

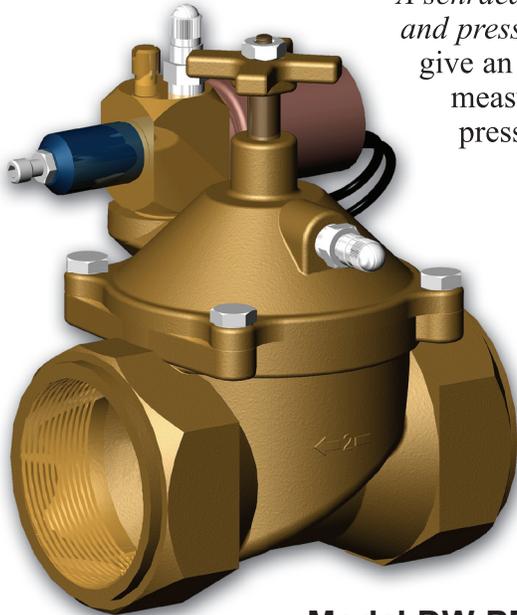
The DW-PRV valve maintains the pressure within +/- 5% despite system pressures up to a 200 psi maximum. Regulation is maintained under both manual and remote operations. Pressure in the downstream side of the line is increased or decreased to an accuracy of +/- 5% by simply adjusting the force of the pilot-port spring.

These features make the DW PRV Series ideal for controlling high pressure conditions caused by severe topographical elevation changes

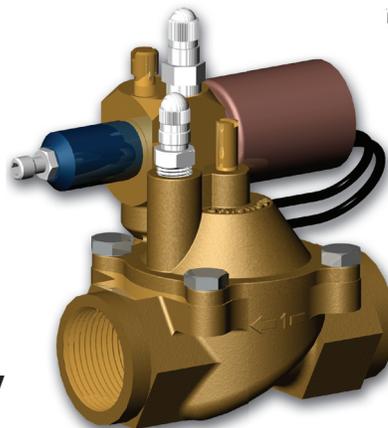
Pressure regulating control



- *A schraeder fitting and pressure gauge* give an accurate measure of the pressure setting.



Model DW-PRV



Technical Features:

- Operating Pressure - 3 to 200 psi
- Flow Range - 0.01 to 160 gpm
- Manual On-Off Control
- Wide control range for pressure-reducing valves
- British Standard Threads (BSPT) - Optional
- Upstream pressure variations ~ 3 to 200 psi
- Downstream pressure adjustment ~ 5 to 125 psi
- Pressure accuracy ~ plus or minus 5%
- Cross handle for 3/4", 1", 1-1/4" sizes - Optional
- Available valve sizes ~ 3/4", 1", 1.25", 1.5", 2"
- 12 volt latching solenoid - Optional

Installation Data

Griswold DW Series remote-control valves can be installed below ground level at any convenient location in the irrigation system. To provide easy access for manually operating the valve or adjusting the closing speed (all valves) and downstream pressure (DW-PRV valves), install the valve in a valve box. Valve dimensions are given in Tables A and B.

Multiple valves connected to single clock-controller should be wired in parallel. The valves are designed to operate with a nominal 24 VAC at the valve connection. Table C lists the minimum voltage and current requirements as a function of the upstream water pressure. Table D gives the required wire size

as a function of both distance and the number of valves on the circuit.

Another factor to consider is the pressure loss within the DW-PRV pressure control valves. The optimum size valve may or may not be the same as the pipe size. First estimate the gallons per minute (GPM) that must flow through the valve. Then subtract the desired downstream pressure from the minimum upstream pressure. Pressure loss caused by the pressure regulation function should be less than this figure.

Table E indicates the minimum size valve you can select for a given flow rate.

A. DIMENSIONS (INCHES):MODEL DWS VALVES

SIZE	MODEL NO.	LENGTH	HEIGHT	WIDTH
3/4"	75 DWS	3.5	4.5	3.0
1"	100 DWS	3.5	4.5	3.0
1-1/4"	125 DWS	3.8	4.5	3.0
1-1/2"	150 DWS	4.5	5.5	4.5
2"	200 DWS	5.5	6.2	4.5

B. DIMENSIONS (INCHES):MODEL DW-PRV VALVES

SIZE	MODEL NO.	LENGTH	HEIGHT	WIDTH
3/4"	75 DWS-PRV	3.5	4.5	3.0
1"	100 DWS-PRV	3.5	4.5	3.0
1-1/4"	125 DWS-PRV	3.8	4.5	3.0
1-1/2"	150 DWS-PRV	4.5	5.5	4.5
2"	200 DWS-PRV	5.5	6.2	4.5

C. MINIMUM POWER TO ACTIVATE VALVE

PRESSURE (PSI)	VOLTAGE (60 Hz RMS)	CURRENT (60 Hz RMS)
100	21.0 vac	375 mA
125	22.0 vac	390 mA
150	23.0 vac	405 mA

D. DISTANCE(FEET) VS. WIRE SIZE (AT 150 PSI)

NO OF VALVES	18 GAUGE WIRES	16 GAUGE WIRES	14 GAUGE WIRES	12 GAUGE WIRES	10 GAUGE WIRES
1	1,500	2,440	3,800	6,000	9,600
2	750	1,220	1,900	3,000	4,800
3	250	407	633	1,000	1,600
4	63	102	158	250	400

E. PRESSURE LOSS (IN PSI) AT VARIOUS FLOW RATES (MINIMUM FLOW RATE: .01 GPM)

VALVE SIZE	P R E L O S S U R E	FLOW RATE (GPW)												
		1-8	10	15	20	30	40	50	60	80	100	120	140	160
3/4"		2.9	4.7	5.6	7.5	10.8								
1"		2.9	4.4	5.4	7.0	9.2	10.3	13.7						
1 1/4"		2.9	4.1	5.1	6.0	8.1	9.1	12.2	16.3					
1 1/2"		2.3	2.5	2.6	2.8	3.4	3.6	4.4	7.0	11.1	14.2			
2"		2.3	2.3	2.4	2.5	2.5	2.6	2.7	2.9	3.4	5.0	5.7	8.0	11.5

For HVAC, Irrigation, OEM, Commercial and Institutional Applications

Job Name _____

Contractor _____

Job Location _____

Approval _____

Engineer _____

Contractor's P.O. No. _____

Approval _____

Representative _____

LEAD FREE*

Butterfly Valves

Series BF-03-M2 Full Lug and BF-04-M2 Wafer

Sizes: 2" – 12" (50 – 300mm)

200psi (13.8 bars)

14" – 24" (350 – 600mm) 150psi (10.3 bars)

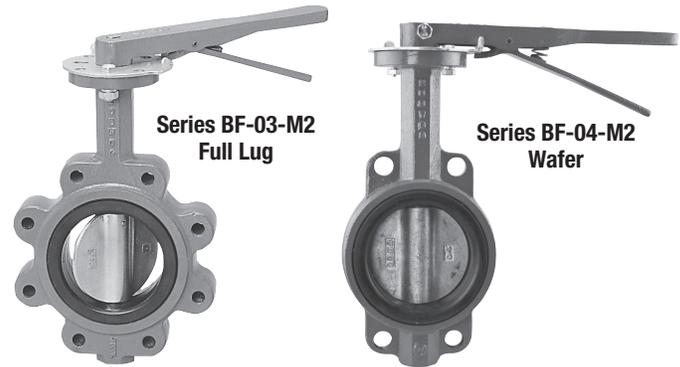
Watts Series BF resilient seated butterfly valve is available in sizes 2" – 24" (50 – 600mm) in wafer or lug body design. Wafer body design features lifting lugs while lug body design features dead-end service. Incorporating a 200psi (13.8 bar) pressure rating for 2" – 12" (50 – 300mm) and a 150psi (10.3 bar) pressure rating 14" – 24" (350 – 600mm), the BF series butterfly is standardly constructed of a ductile iron body with a choice of either ductile iron, aluminum bronze, or 316 stainless steel discs and 416 stainless steel or 316 stainless steel shaft. A phenolic-backed seat (2"-12", 50-300mm) or aluminum-backed seat (14" – 24", 350-600mm) prevents the seat from collapsing or dislodging. Standard seat materials available include EPDM, Buna-N and Viton. The BF Series mounting pad is designed to ISO 5211 standard to accommodate lever handles, gear operators, or actuation.

The Watts Series BF butterfly valves are designed and manufactured for use with ANSI 125 or 150 Class flanges and comply with API 609 and MSS-SP 67 standards to meet the stringent requirements of HVAC, Irrigation, OEM, Commercial, Institutional, and Industrial applications.

Features

- **Body** – Available in Full Lug (BF-03-M2) and Wafer (BF-04-M2) styles designed for use between ANSI 125 and 150 flanges. Face-to-face dimensions comply with API 609 and MSS-SP-67. All valves are designed to accommodate 2" of insulation. The mounting pad is designed to ISO 5211 standard. The body material is ASTM A-536 ductile iron.
- **Disc** – Disc edge is machined and polished 360 degrees to assure leak-tight shutoff while minimizing operating torque. Positive, disc-to-shaft connection is provided by stainless steel precision taper pins. Discs are available in ductile iron, aluminum bronze, or 316 stainless steel.

*The wetted surface of this product contacted by consumable water contains less than one quarter of one percent (0.25%) of lead by weight.



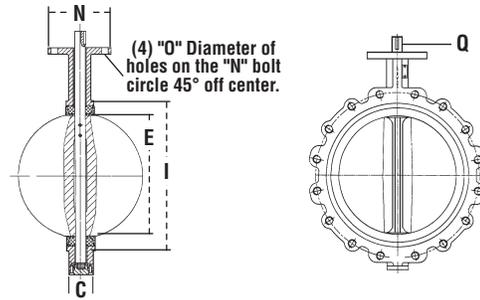
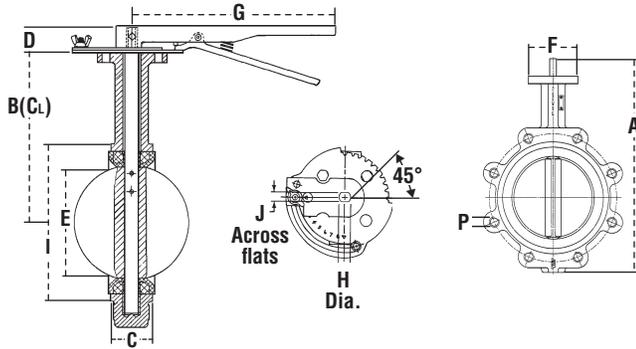
- **Seat** – Phenolic or aluminum backed, non-collapsible, resilient seat is mechanically secured to provide dead-end service to the full pressure rating in lug style valves. Full 360 degrees sealing isolates the body components from the media and provides the primary shaft seal. Seats are available in EPDM, Buna-N, and Viton.
- **Shaft** – One-piece shaft delivers positive disc-to-seat location with maximum strength. 416SS is standard shaft with ductile iron and aluminum bronze disc. 316SS shaft is standard with 316SS disc models.
Three shaft bushings provide shaft support for proper alignment and minimal shaft deflection. Bi-directional shaft seals prevent external contamination of the stem area and provide backup for the primary shaft seal formed by the disc/seat interface.
- **Handle** – ISO 5211 top work design allows for standard 10 position handle 2" – 6" (50 – 150mm) and manual, worm gear operators for 8" – 24" (200 – 600mm) sizes. An infinite positioning locking handle is an available option on 2" – 12" (50 – 300mm) valves. The posi-lok handle provides an infinite position stop, a memory stop, and a pad-locking device in the fully closed position.

Watts product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Watts Technical Service. Watts reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Watts products previously or subsequently sold.

WATTS®

Dimensions

2" through 24"



Size																				
in.	A	B	C	D	E	F	G	H	I	J										
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm									
2	10 ⁹ / ₁₆	273	6 ¹ / ₁₆	161	1 ¹ / ₂	42	1 ¹ / ₄	32	2 ¹ / ₂	54	3 ¹ / ₁₆	77	10 ¹ / ₂	267	1/2	13	3 ³ / ₄	95	3/8	9
2 1/2	11 ¹ / ₈	295	6 ³ / ₁₆	175	1 ³ / ₄	45	1 ¹ / ₄	32	2 ¹ / ₂	64	3 ¹ / ₁₆	77	10 ¹ / ₂	267	1/2	13	4 ¹ / ₄	108	3/8	9
3	12 ¹ / ₂	308	7 ¹ / ₈	181	1 ³ / ₄	45	1 ¹ / ₄	32	3 ¹ / ₈	79	3 ¹ / ₁₆	77	10 ¹ / ₂	267	1/2	13	4 ³ / ₄	120	3/8	9
4	13 ³ / ₈	346	7 ³ / ₈	200	2	52	1 ¹ / ₄	32	4 ¹ / ₈	105	3 ³ / ₁₆	92	10 ¹ / ₂	267	3/8	16	6 ¹ / ₁₆	154	7/16	11
5	14 ¹ / ₂	372	8 ¹ / ₈	213	2 ¹ / ₁₆	56	1 ¹ / ₄	32	4 ¹ / ₂	124	3 ³ / ₁₆	92	10 ¹ / ₂	267	3/4	19	7 ¹ / ₈	181	1/2	13
6	15 ³ / ₈	397	8 ³ / ₈	226	2 ³ / ₁₆	56	1 ¹ / ₄	32	6 ¹ / ₈	156	3 ³ / ₁₆	92	10 ¹ / ₂	267	3/4	19	8 ³ / ₁₆	208	1/2	13
8	18 ¹ / ₂	479	10 ¹ / ₄	260	2 ³ / ₈	60	1 ¹ / ₄	32	8	202	5	125	14	356	1/2	22	10 ¹ / ₄	260	3/8	16
10	21 ¹ / ₄	540	11 ¹ / ₂	292	2 ³ / ₈	66	1 ¹ / ₄	45	9 ¹ / ₂	251	5	125	14	356	1/2	29	12 ¹ / ₂	320	1 ¹ / ₂	21
12	24 ¹ / ₂	626	13 ³ / ₈	337	3	76	1 ¹ / ₄	45	11 ¹ / ₂	301	6	150	14	356	1/2	32	14 ¹ / ₂	375	--	--
14	26 ³ / ₈	679	14 ¹ / ₂	368	3	76	1 ¹ / ₄	45	13 ¹ / ₈	333	6	150	--	--	1 ¹ / ₂	32	15 ¹ / ₈	405	--	--
16	30	762	15 ¹ / ₄	400	3 ¹ / ₈	87	2	50	15 ³ / ₈	391	6 ¹ / ₈	175	--	--	1 ¹ / ₂	33	18 ¹ / ₂	470	--	--
18	31 ¹ / ₂	800	16 ¹ / ₈	422	4 ¹ / ₈	105	2	50	17 ¹ / ₈	442	6 ¹ / ₈	175	--	--	1 ¹ / ₂	38	20 ¹ / ₈	525	--	--
20	35 ³ / ₈	897	18 ¹ / ₄	480	5 ¹ / ₈	130	2 ¹ / ₈	53	19 ³ / ₈	493	8 ¹ / ₄	210	--	--	1 ¹ / ₂	41	22 ¹ / ₄	565	--	--
24	42 ¹ / ₂	1088	22 ¹ / ₂	562	6	152	2 ¹ / ₄	58	23 ³ / ₈	594	8 ¹ / ₄	210	--	--	2	50	27 ³ / ₁₆	693	--	--

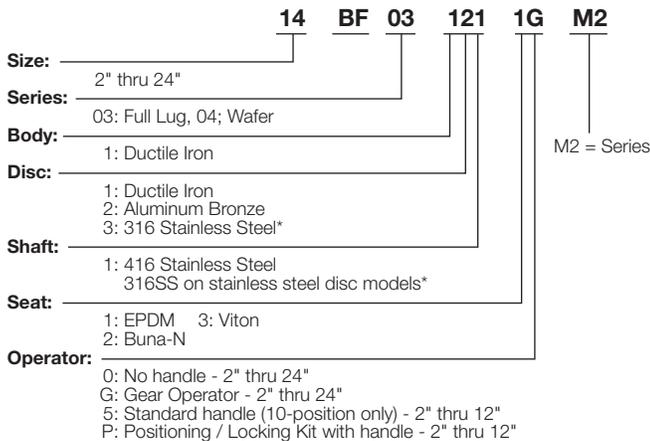
SEATING TORQUE Buna-N, EPDM		
Size	Normal Conditions	
in.	Wet lbs.	Dry lbs.
2	134	214
2 1/2	190	289
3	250	387
4	390	644
5	600	959
6	907	1,542
8	1,697	2,919
10	2,500	4,857
12	3,300	7,071
14	3,500	7,305
16	5,500	10,027
18	8,200	13,437
20	10,000	17,925
24	18,680	28,020

GEAR DIMENSIONS: STD. WEATHERPROOF W/ HANDWHEEL									
Valve Size	Depth	Width	CL to			Turns Open/Close	Unit		
			HW Dia.	Height	MT Pad				
in.	A	B	C	D	E	F	lbs.		
2, 2 1/2, 3	5.0	4.2	6.5	6.0	2.7	1.5	7.0	10.0	
4	5.0	4.2	6.5	6.0	2.7	1.5	7.0	10.0	
5, 6	5.0	4.2	6.5	6.0	2.7	1.5	7.0	10.0	
8	7.0	6.2	9.5	12.0	3.0	1.8	7.5	27.5	
10	7.0	6.2	9.5	12.0	3.0	1.8	7.5	27.5	
12, 14	7.8	6.4	9.5	12.0	3.0	2.0	12.5	33.0	
16	11.5	9.6	15.0	16.0	4.2	2.5	20.0	70.5	
18	11.5	9.6	15.0	16.0	4.2	2.5	20.0	70.5	
20	11.5	9.6	15.0	16.0	4.2	2.5	20.0	70.5	
24	12.6	9.1	15.0	24.0	4.5	2.0	20.0	80.0	

Size	TOP PLATE DRILLING		TAPPED LUG DATA		KEY WAY		WEIGHT lbs. †		C _v RATING (Full Open)					
	N	O	BOLT CIRCLE	NO. HOLES	BOLT P	Q	88	87	Size	C _v Rating				
in.	in.	mm	in.	mm	in.	mm			in.					
2	2	50	1/4	7	4 1/4	121	4	3/8"-11UNC x 1 1/8"	--	--	8	6	2	135
2 1/2	2	50	1/4	7	5 1/2	140	4	3/8"-11UNC x 1 3/4"	--	--	10	7	2 1/2	220
3	2	50	1/4	7	6	150	4	3/8"-11UNC x 1 3/4"	--	--	10	7	3	302
4	2 1/4	70	3/8	10	7 1/2	191	8	3/8"-11UNC x 2"	--	--	17	12	4	600
5	2 1/4	70	3/8	10	8 1/2	216	8	3/4"-10UNC x 2 1/2"	--	--	25	16	5	1,022
6	2 3/4	70	3/8	10	9 1/2	241	8	3/4"-10UNC x 2 1/2"	--	--	27	20	6	1,579
8	4	102	1/2	13	11 3/4	298	8	3/4"-10UNC x 2 1/2"	--	--	40	29	8	3,136
10	4	102	1/2	13	14 1/4	362	12	1/2"-9UNC x 2 1/2"	--	--	63	48	10	5,340
12	5	125	1/2	13	17	432	12	1/2"-9UNC x 3"	1/4 x 1 1/4	6 x 32	107	78	12	8,250
14	5	125	1/2	13	18 3/4	476	12	1"-8UNC x 3"	1/4 x 1 1/4	6 x 32	156	99	14	11,917
16	5 1/2	140	11/16	18	21 1/4	540	16	1"-8UNC x 3 3/8"	3/16 x 1 1/2	8x46	203	140	16	16,388
18	5 1/2	140	11/16	18	22 3/4	578	16	1 1/8"-7UNC x 4 1/8"	3/8 x 1 1/2	10x40	269	188	18	21,705
20	5 1/2	165	3/4	22	25	635	20	1 1/8"-7UNC x 5 1/8"	3/8 x 1 1/2	10x40	392	248	20	27,908
24	5 1/2	165	3/4	22	29 1/2	750	20	1 1/4"-7UNC x 6"	1/2 x 2 3/8	13x60	593	450	24	43,116

†Weights are for valves with ductile iron or aluminum bronze discs. 2" - 12" have levers; 14" - 24" have bare shafts. Refer to Watts F-CDBF for gear operator weights.

How to Order Watts Series BF-M2

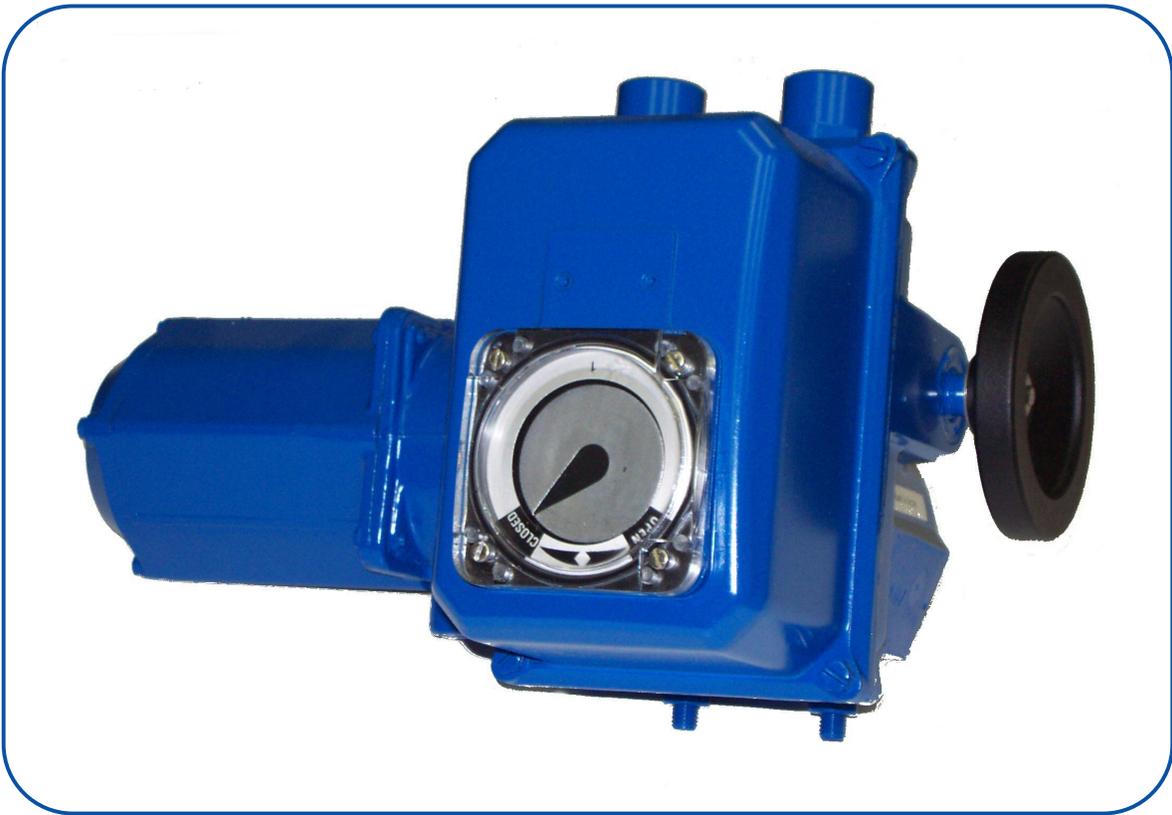


A Watts Water Technologies Company

Materials

- Body:** ASTM A-536 Ductile Iron.
- Bushing:** Duralon(3): Teflon® - Dacron inner liner bonded to fiberglass - epoxy resin outer shell 2"-12" (50-300mm), Bronze 14"-24" (350-600mm)
- Stem O-rings:** Buna-N
- Disc:** ASTM A-395 Ductile Iron / Electroless Nickel Plated
ASTM A-148 Aluminum Bronze
ASTM A-351 316 Stainless Steel
- Shaft:** 416 Stainless Steel
316 Stainless Steel on 316SS Disc Models
- Seat:** EPDM: +5°F to 248°F (-15°C to +120°C)
Buna-N: +14°F to 176°F (-10°C to +80°C)
Viton: -4°F to 302°F (-20°C to +150°C)
- Note:** Do not use EPDM when hydrocarbons are present.





QUARTER-TURN ELECTRIC ACTUATOR TYPE OA

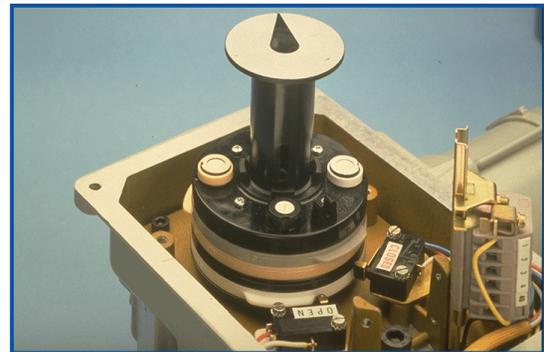
DESCRIPTION:

Type OA Quarter-turn actuators offer a very compact waterproof body with the same sturdy features of larger industrial actuators:

largely dimensioned worm and quadrant output gear (naturally selflocking), ease of adjustment, precise and vibration proof end of travel system, heavy duty motors with internal thermal protection, emergency manual handwheel, easy to read position indicator, ISO flange and removable socket permits direct or indirect mounting on any type of quarter-turn valve.

SPECIFICATIONS:

Quarter-turn, watertight body to NEMA 4, 4X & 6, proportional position indicator, self locking gear, S4-30% duty rating motor, class F insulated, 2 end of travel switches adjustable over the entire travel, anti-condensation heater, 2 adjustable mechanical stops, thermal protection, emergency handwheel mounted on the final reduction stage, 2 conduit entries, combined with F05/F07 ISO flange.



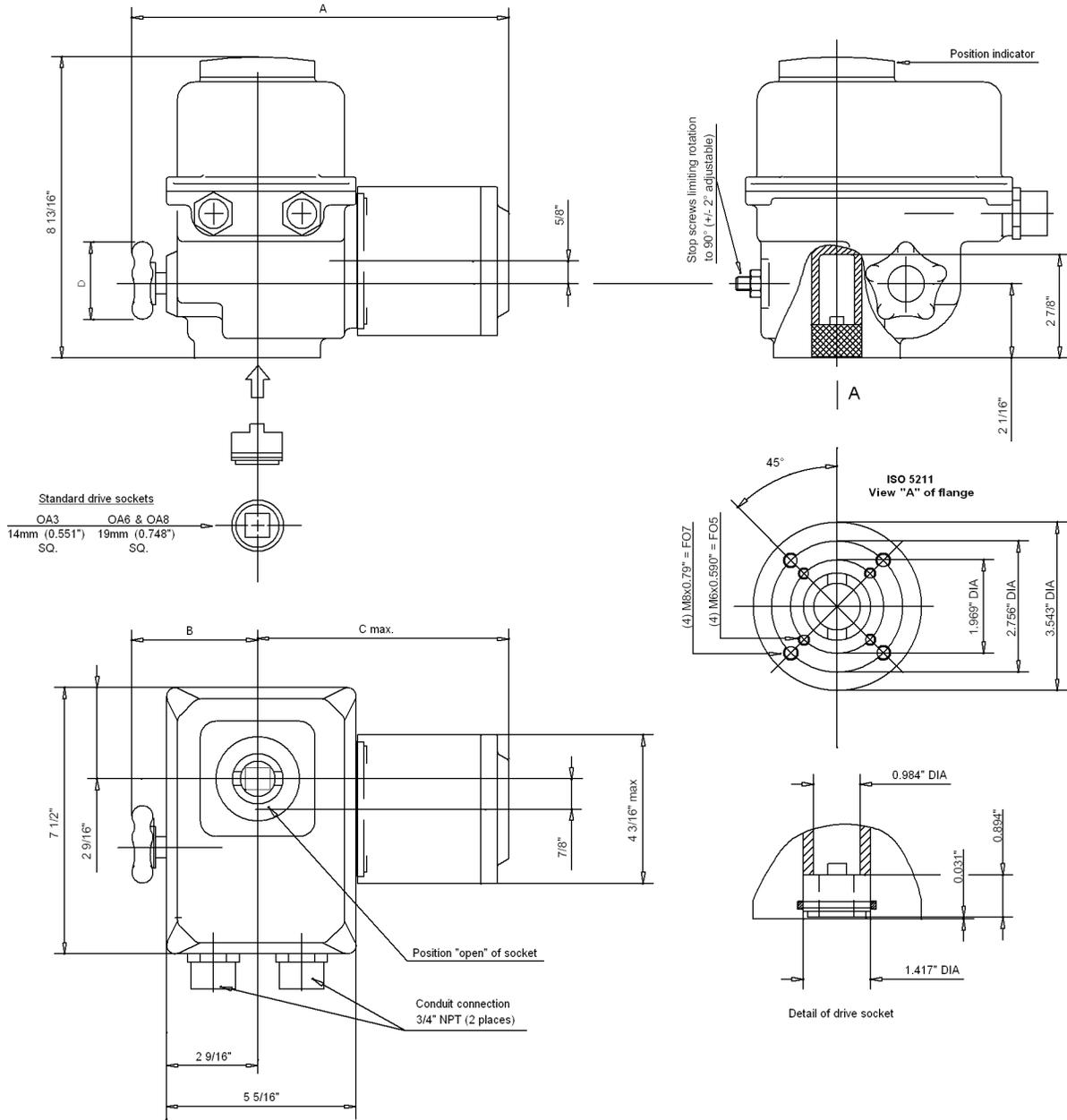
TECHNICAL DATA

Type	Torque in-lbs	Operating time s/90°	Flange ISO
OA3	310	5	F05 / 07
OA6	540	5	F05 / 07
OA8	885	5 - 25 - 50	F05 / 07
OA15	1350	15 - 25	F07

OPTIONS:

- 2 auxillary limit switches (free contacts)
- Position sensor by potentiometer 1000 Ω
- Position transmitter 4-20 mA, type TAM
- INTEGRAL+ local control
- MiniGRAL+ remote control
- MiniGAM+ or PosiGAM+ modulating control

DIMENSIONAL DRAWING:



Type	A	B	C	ØD	Weight lbs
OA3	9.88"	3.54"	6.31"	Ø2.36"	12
OA6	11.5"	3.54"	7.88"	Ø2.36"	13
OA8	11.5"	3.54"	7.88"	Ø2.36"	15
OA15	14.63"	4.38"	10.24"	Ø3.94"	17

Note: The OA15 drive socket has 4 engagement claws.

L. BERNARD Controls Inc.

15740 Park Row, Suite 100 - Houston, Texas 77084

Phone: 1-281-578-6666 - Fax: 1-281-578-2797 - E-mail: bsales@bernardcontrols.com

3PH 460 V 60 Hz On/Off

Max torque in-lbs	Permanent torque in-lbs	Type	Operating time 90°/sec	Flange ISO	Power Kw	Speed rpm	S4 service - D.R. : 30%			
							Curent rated A	Curent start A	Cos φ	Efficiency %
885	531	OA8	5	F05 / 07	0.12	1800	0.6	1.1	0.6	40
885	531	OA8	25	F05 / 07	0.04	1800	0.3	0.5	0.5	30
1,330	710	OA15	15	F07 / (10)	0.04	1800	0.3	0.5	0.5	30
1,330	710	OA15	25	F07 / (10)	0.04	1800	0.3	0.5	0.5	30
2,655	1,240	AT25	8	F07 / 10	0.12	1800	0.8	1.6	0.5	37
2,215	1,240	AT25	25	F07 / 10	0.04	1800	0.3	0.5	0.5	30
2,215	1,240	AT25	50	F07 / 10	0.04	1800	0.3	0.5	0.5	30
5,310	3,540	AT50	25	F10 / 07	0.07	1800	0.3	0.8	0.8	35
10,620	6,640	BT100	50	F12 / (14)	0.07	1800	0.3	0.8	0.8	35

1PH 115 V 60 Hz On/Off

Max torque in-lbs	Permanent torque in-lbs	Type	Operating time 90°/sec	Flange ISO	Power Kw	Speed rpm	S4 service - D.R. : 30%			
							Curent rated A	Curent start A	Cos φ	Efficiency %
310	310	OA3	5	F05 / 07	0.024	1800	1	1.2	0.9	22
885	531	OA8	5	F05 / 07	0.07	1800	2.2	4.3	0.9	40
885	531	OA8	25	F05 / 07	0.024	1800	1	1.2	0.9	22
1,330	710	OA15	15	F07 / (10)	0.05	1800	1.9	2.5	0.9	18
1,330	710	OA15	25	F07 / (10)	0.03	1800	1.3	2	0.9	23
2,215	1,240	AT25	15	F07 / 10	0.05	1800	2.2	4.3	0.9	40
2,215	1,240	AT25	25	F07 / 10	0.03	1800	1.3	2	0.9	23
2,215	1,240	AT25	50	F07 / 10	0.03	1800	1.3	2	0.9	23
5,310	3,540	AT50	25	F10 / 07	0.08	1800	2.2	4.3	0.8	40
10,620	6,640	BT100	50	F12 / (14)	0.08	1800	2.2	4.3	0.9	40



TECHNICAL BROCHURE

B35-85GS R1

FEATURES

Powered for Continuous Operation: All ratings are within the working limits of the motor as recommended by the motor manufacturer. Pump can be operated continuously without damage to the motor.

Field Serviceable: Units have left hand threads and are field serviceable with common tools and readily available repair parts.

Sand Handling Design: Our face clearance, floating impeller stack has proven itself for over 50 years as a superior sand handling, durable pump design.

FDA Compliant Non-Metallic Parts: Impellers, diffusers and bearing spiders are constructed of glass filled engineered composites. They are corrosion resistant and non-toxic.

Discharge Head/Check Valve: Cast 303 stainless steel for strength and durability. Two cast-in safety line loops for installer convenience. The built-in check valve is constructed of stainless steel and FDA compliant BUNA rubber for abrasion resistance and quiet operation.

Motor Adapter: Cast 303 stainless steel for rigid, accurate alignment of pump and motor. Easy access to motor mounting nuts using standard open end wrench.

Stainless Steel Casing: Polished stainless steel is strong and corrosion resistant.

Hex Shaft Design: Six sided shafts for positive impeller drive.

Engineered Polymer Bearings: The proprietary, engineered polymer bearing material is strong and resistant to abrasion and wear. The enclosed upper bearing is mounted in a durable Noryl® bearing spider for excellent abrasion resistance.

e-GS

35GS, 45GS, 65GS & 85GS

35-85 GPM 1-10HP, 60 HZ, SUBMERSIBLE PUMPS



WATER END DATA

Series	Model	Required HP	Stages	Water End	
				Length (in)	Weight (lbs)
35GS	35GS10	1	6	14.2	8
	35GS15	1.5	8	16.6	9
	35GS20	2	10	19.1	10
	35GS30	3	14	24.0	13
	35GS50	5	23	36.4	20
	35GS75	7.5	36	53.0	28
	35GS100	10	46	65.2	34
45GS	45GS15	1.5	5	12.9	8
	45GS20	2	7	15.4	9
	45GS30	3	10	19.0	10
	45GS50	5	17	27.7	15
	45GS75	7.5	25	38.9	21
	45GS100	10	34	50.6	27
	65GS	65GS15	1.5	6	19.1
65GS20		2	7	21.2	11
65GS30		3	10	27.4	12
65GS50		5	16	41.2	18
65GS75		7.5	26	62.3	35
65GS100		10	33	76.8	42
85GS		85GS30	3	8	29.4
	85GS50	5	14	42.8	18
	85GS75	7.5	21	63.8	35
	85GS100	10	27	79.9	41

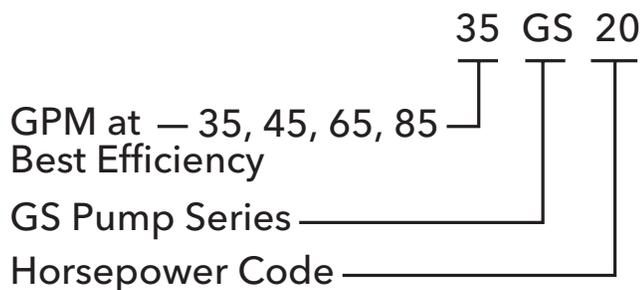
SPECIFICATIONS

Model	Flow Range GPM	Horse-Power Range	Best Efficiency GPM	Discharge Connection	Minimum Well Size	Rotation
35GS	10-50	1.0 - 10	35	2"	4"	CCW
45GS	20 - 65	1.5 - 10	45	2"	4"	CCW
65GS	30 - 80	1.5 - 10	65	2"	4"	CCW
85GS	40 - 120	3.0 - 10	85	2"	4"	CCW

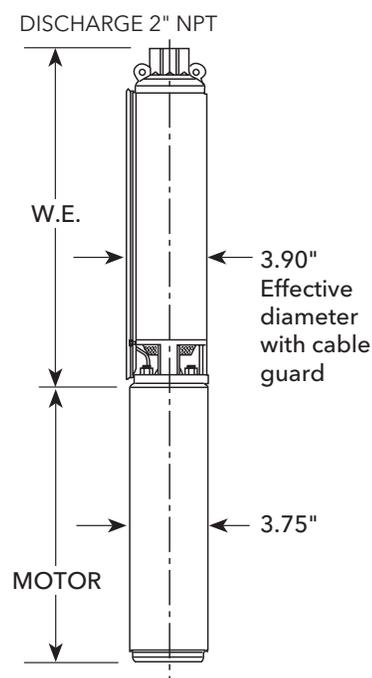
"GS" SERIES MATERIALS OF CONSTRUCTION

Part Name	Material
Discharge Head	AISI 303 SS
Check Valve Poppet	AISI 303 SS
Check Valve Seal	BUNA, FDA Compliant
Check Valve Seat	AISI 304 SS
Check Valve Retaining Ring	AISI 302 SS
Bearing Spider - Upper	Noryl
Bearing	Proprietary Engineered Polymer
Klipring	AISI 301 SS
Diffuser	Noryl
Impeller	Noryl
Bowl	AISI 304 SS
Intermediate Sleeve*	AISI 304 SS, Powder Metal
Intermediate Shaft Coupling*	AISI 304 SS, Powder Metal
Intermediate Bearing Spider*	Noryl
Intermediate Bearing Spider*	AISI 303 SS
Shim	AISI 304 SS
Screws - Cable Guard	AISI 304 SS
Motor Adapter	AISI 303 SS
Casing	AISI 304 SS
Shaft	17-4 PH Stainless Steel
Coupling	AISI 304 SS, Powder Metal
Cable Guard	AISI 304 SS
Suction Screen	AISI 304 SS

NOMENCLATURE - SOLD AS WATER ENDS ONLY



10 = 1	50 = 5
15 = 1½	75 = 7½
20 = 2	100 = 10
30 = 3	



CENTRIPRO 4" SINGLE-PHASE MOTORS

Order No.	Type	HP	Volts	Length in. (mm)	Weight lb. (kg.)
M10422	2-wire PSC	1	230	13.3 (337)	24.5 (11.1)
M15422		1.5		14.9 (378)	28.9 (13.1)
M10412	3-wire	1	230	11.7 (297)	23.1 (10.5)
M15412		1.5		13.6 (345)	27.4 (12.4)
M20412		2		15.1 (383)	31.0 (14.1)
M30412		3		18.3 (466)	40.0 (18.1)
M50412		5		27.7 (703)	70.0 (31.8)

CENTRIPRO 4" THREE-PHASE MOTORS

Order No.	HP	Volts	Length in. (mm)	Weight lb. (kg.)
M10430	1	200	11.7 (297)	22 (10.4)
M15430	1.5		11.7 (297)	22 (10.4)
M20430	2		13.8 (351)	28 (12.7)
M30430	3		15.3 (389)	32 (14.5)
M50430	5		21.7 (550)	55 (24.9)
M75430	7.5		27.7 (703)	70 (31.8)
M10432	1	230	11.7 (297)	23 (10.4)
M15432	1.5		11.7 (297)	23 (10.4)
M20432	2		13.8 (351)	28 (12.7)
M30432	3		15.3 (389)	32 (14.5)
M50432	5		21.7 (550)	55 (24.9)
M75432	7.5		27.7 (703)	70 (31.8)
M10434	1	460	11.7 (297)	23 (10.4)
M15434	1.5		11.7 (297)	23 (10.4)
M20434	2		13.8 (351)	28 (12.7)
M30434	3		15.3 (389)	32 (14.5)
M50434	5		21.7 (550)	55 (24.9)
M75434	7.5		27.7 (703)	70 (31.8)
M100434	10		-	-
M15437	1.5	575	11.7 (297)	23 (10.4)
M20437	2		15.3 (389)	32 (14.5)
M30437	3		15.3 (389)	32 (14.5)
M50437	5		27.7 (703)	70 (31.8)
M75437	7.5		27.7 (703)	70 (31.8)

NEMA MOTOR

- Corrosion resistant stainless steel construction.
- Built-in surge arrestor is provided on single phase motors through 5 HP.
- Stainless steel splined shaft.
- Hermetically sealed windings.
- Replaceable motor lead assembly.
- NEMA mounting dimensions.
- Control box is required with 3 wire single phase units.
- Three phase units require a magnetic starter with three leg Class 10 overload protection.

AGENCY LISTINGS



CentriPro Motor - tested to UL778 and CAN 22.2 by CSA International (Canadian Standards Association)



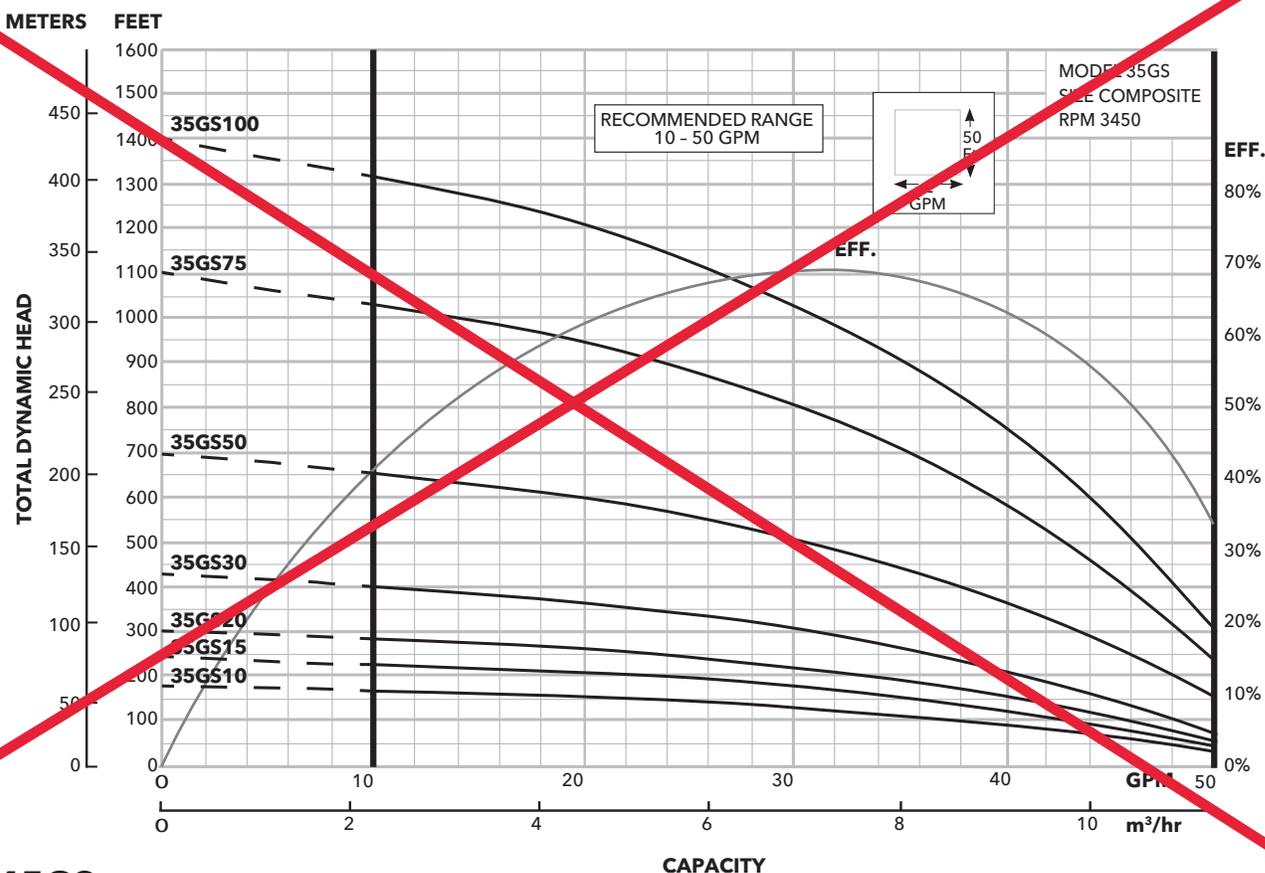
CentriPro Motor - Certified to NSF/ANSI 61, Annex G, Drinking Water System Components 4P49



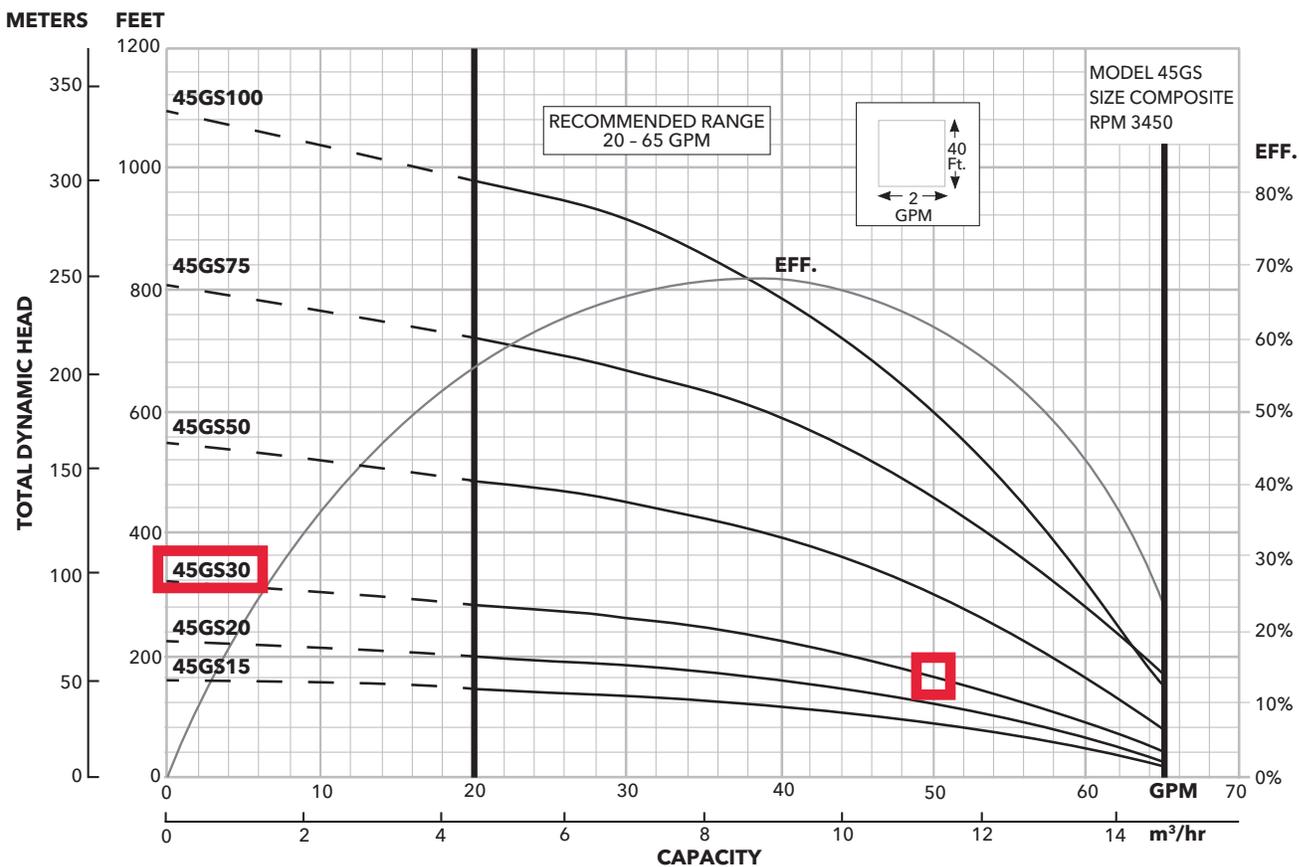
NSF/ANSI 372 - Drinking Water System Components - Lead Content

CLASS 6853 01 - Low Lead Content Certification Program - Plumbing Products

Model 35GS



Model 45GS



MODEL 45GS

SELECTION CHART

Horsepower Range 1½ - 5, Recommended Range 20 - 65 GPM, 60 Hz, 3450 RPM

Pump Model	HP	PSI	Depth to Water in Feet/Ratings in GPM (Gallons per Minute)																											
			20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	440	480	520	560	600	640		
45GS15	1½	0	64	61	57	52	46	37	23																					
		20	55	50	44	34																								
		30	49	43	32																									
		40	41	30																										
		50	27																											
		60																												
Shut-off PSI			61	52	44	35	26	18	9																					
45GS20	2	0		62	60	57	53	49	45	40	32																			
		20	59	56	52	48	43	38	28																					
		30	55	51	47	43	36	26																						
		40	51	47	42	35	25																							
		50	46	41	34	22																								
		60	40	46	37	38	28	29																						
Shut-off PSI			60	50	41	32	23	15	7	0																				
45GS30	3	0		65	62	60	59	56	53	50	47	45	41	37	30	21														
		20	62	60	58	55	52	49	47	44	40	35	28																	
		30	60	58	55	52	49	46	43	39	34	26																		
		40	57	54	51	49	46	42	38	33	25																			
		50	54	51	48	45	42	38	32	23																				
		60	51	48	45	41	37	31	22																					
Shut-off PSI			130	121	113	104	95	87	78	69	61	52	43	35	26	17														
45GS50	5	0				65	63	62	61	60	59	58	56	53	51	50	48	46	44	42	39	32	22							
		20		64	63	61	60	59	58	57	56	54	53	51	49	47	46	43	41	38	35	31	20							
		30	64	62	61	60	59	58	57	55	54	52	51	49	47	45	43	41	38	34	30	25								
		40	62	61	60	59	58	57	55	54	52	50	49	47	45	43	40	37	33	29	24									
		50	61	60	59	58	56	55	53	52	50	48	47	45	42	40	37	33	28	23										
		60	60	59	58	56	55	53	52	50	48	46	44	42	39	36	32	28	22											
Shut-off PSI			228	220	211	202	194	185	176	168	159	150	142	133	124	116	107	98	90	81	72	64	46	29						

Horsepower Range 7½ - 10, Recommended Range 20-65 GPM, 3450 RPM

Pump Model	HP	PSI	Depth to Water in Feet/Ratings in GPM (Gallons per Minute)																										
			40	80	120	160	200	240	280	320	360	400	440	480	520	560	600	640	680	720	760	800	840	880	920	960	1000	1040	
45GS75	7½	0					63	62	60	58	56	53	51	48	46	43	39	34	28	21									
		20				63	61	60	57	55	53	50	48	45	42	38	33	27	19										
		30			64	62	60	58	56	54	51	49	46	43	40	35	30	23											
		40		65	63	61	59	57	55	52	50	47	45	41	37	32	26												
		50		64	62	60	58	56	54	51	49	46	43	39	35	29	21												
		60	65	63	61	59	57	55	52	50	47	44	41	37	31	25													
Shut-off PSI			332	315	298	280	263	246	228	211	194	177	159	142	125	107	90	73	55	38									
45GS100	10	0				65	64	63	61	60	58	57	55	54	53	51	50	48	46	44	42	39	36	32	28	23			
		20			65	64	63	61	60	58	57	55	54	52	51	49	48	46	44	42	39	36	32	27	22				
		30		65	64	63	62	60	59	57	56	54	53	52	50	49	47	45	43	40	37	33	29	24					
		40		65	64	62	61	60	58	56	55	54	52	51	49	48	46	44	41	38	35	31	26	21					
		50	65	64	63	62	60	59	57	56	54	53	51	50	48	47	45	42	40	36	33	28	23						
		60	65	64	62	61	59	58	56	55	53	52	50	49	47	45	43	41	38	34	30	26	20						
Shut-off PSI			456	439	422	404	387	370	353	335	318	301	283	266	249	231	214	197	179	162	145	127	110	93	75	58			

Xylem |'zīləm|

- 1) The tissue in plants that brings water upward from the roots;
- 2) a leading global water technology company.

We're a global team unified in a common purpose: creating advanced technology solutions to the world's water challenges. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. Our products and services move, treat, analyze, monitor and return water to the environment, in public utility, industrial, residential and commercial building services settings. Xylem also provides a leading portfolio of smart metering, network technologies and advanced analytics solutions for water, electric and gas utilities. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise with a strong focus on developing comprehensive, sustainable solutions.

For more information on how Xylem can help you, go to www.xyleminc.com



Xylem Inc.
2881 East Bayard Street Ext., Suite A
Seneca Falls, NY 13148
Phone: (866) 325-4210
Fax: (888) 322-5877
www.gouldswatertechnology.com

Goulds is a registered trademark of Goulds Pumps, Inc. and is used under license.
CentriPro is a trademark of Xylem Inc. or one of its subsidiaries.
Noryl and Lexan are trademarks of GE Plastic.
© 2018 Xylem Inc. B35-85GS R1 March 2018

PRODUCT DATA REPORTING FORM for LEED v4 Projects

THIS FORM IS REQUIRED TO BE SUBMITTED WITH Product Data Submittals

You must include backup documentation such as SPECIFIC Product Data Sheets, Cut Sheets, Product Specific Letter from Manufacturer, etc. **DO NOT INCLUDE GENERIC MARKETING MATERIAL**

LEED PROJECT NAME: SOMERVILLE HIGH SCHOOL
 SUBCONTRACTOR: THE DOW COMPANY
 Specification Section: 22 11 30 Submittal Number: RAINWATER HARVESTING SYSTEM

Project Product Data				Materials and Resources LEED Credits										Low-Emitting Materials LEED Credits			
Product	Manufacturer	Product Costs ¹ (only exclude install labor) (\$)	Product Specific (PS) or Industry Wide (IW) Env. Product Declaration (EPD) ³ ?									ONLY if product has FSC or recycled content, then fill Regional Data		Some Qualifying VOC Standards (More in Note 10): CDPH Standard Method v1.1 FloorScore: Hard Surfaces & Adhesives Green Label Plus: Carpet, Adhesive, Cushion UL Greengaurd Gold: When Meeting CDPH Std. v1.1			
				FSC Certified ⁷ Wood Products? (%)	Post-Consumer Recycled Content ⁸ (%)	Pre-Consumer Recycled Content ⁹ (%)	Extended Producer Responsibility ⁵ Program Name?	Declare Label with ingredient disclosure greater than 1000 ppm?	Fully Declared HPD to 1000 ppm Declaration ⁴ included?	C2C version (2.1.1 or 3.0) Level of Certification		Extracted, Manufactured, & Purchased within ² 100 miles?	CDPH Emissions ¹⁰ testing compliant?	VOC Content ¹¹ (g/L)	Wet-Applied Products Volume Used (L)	Wood Products are ULEF or NAUF ¹² ?	
Ex.	ABC Product	ABC, Inc.	\$ XX,XXX	PS / IW	%	%	%	Yes / No	Yes / No	Yes / No	##	##	Yes / No				
1	RAINWATER HARVEST TANKS	XERXES	\$130,000	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2	RAINWATER PUMPING SYSTEM	GOULD	\$50,000	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3																	
4																	
5																	
6																	
7																	
8																	
9																	

NOTES / DEFINITIONS:

- Furnish Costs include all expenses to deliver the material to the project site, including taxes, transport, fabrication and profit. Do not include site labor or installation.
- Within 100 miles distance is defined as travel by air to the project site, not travel distance by road. <http://www.distancefromto.net/>
- Environmental Product Declarations which conform to ISO 14025, 14040, 14044, and EN 15804 or ISO 21930 and have at least a cradle to gate scope. <http://productguide.ulenvironment.com/QuickSearch.aspx>
- The end use product has a published, complete Health Product Declaration with full disclosure of known hazards in compliance with the Health Product Declaration open Standard. [Smith Group JIR HPD Database](http://www.smithgroup.com/Products/Health-Product-Declaration)
- Extended producer responsibility. Products purchased from a manufacturer (producer) that participates in an extended producer responsibility program or is directly responsible for extended producer responsibility. (e.g. Closed Loop or Take Back Program)
- Wood products must be certified by the Forest Stewardship Council (FSC) and must provide proof of vendor FSC Chain-of-Custody with this Product Data Submittal. <http://info.fsc.org/certificate.php>
- Post-Consumer Recycled Content: Sourced from recovered Consumer Waste and used as a raw material (e.g. plastic bottles, newspaper, etc).
- Pre-Consumer Recycled Content: Recovered Industrial Materials diverted from municipal solid waste for use in a different mfg. process, prior to use by a consumer. Note: "home scrap" from the original mfg. process that are reused / reprocessed do not qualify.
- TVOC Emissions for Building products must be tested and determined compliant in accordance with California Department of Public Health (CDPH) Standard Method v1.1-2010 <http://www.usgbc.org/resources/low-emitting-materials-third-party-certification-table>
- All paints and coatings wet-applied on site must meet applicable VOC limits of the California Air Resources Board (CARB) 2007, Suggested Control Measure (SCM) for Architectural Coatings, or the South Coast Air Quality Management District (SCAQMD) Rule 1113, effective June 3, 2011. All adhesives and sealants wet-applied on site must meet the applicable chemical content requirements of SCAQMD Rule 1168, July 1, 2005, Adhesive and Sealant Applications, as analyzed by the methods specified in Rule 1168.
- Composite Wood Evaluation as defined by the California Air Resources Board (CARB), Airborne Toxic Measure to Reduce Formaldehyde Emissions from Composite Wood Products Regulation, must be documented to have low formaldehyde emissions that meet the CARB ATCM for formaldehyde requirements for ultra-low-emitting formaldehyde (ULEF) resins or no added formaldehyde (NAUF) resins.

I, _____ a duly authorized representative of _____ hereby certify that the material information submitted here is an accurate representation of the material to be provided under our contract.

EMAIL CONTACT FOR AUTHORIZED REPRESENTATIVE: _____ Direct Phone: _____

SIGNATURE OF AUTHORIZED REPRESENTATIVE: _____ DATE: _____