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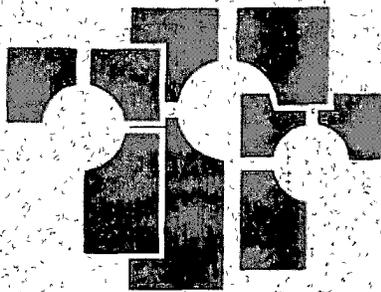
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08/28/2012

**PROJECT SPECIFICATIONS AND  
CONTRACT DOCUMENTS**

**PROJECT 111226**

**ARROWHEAD RANCH WATER RECLAMATION FACILITY  
EFFLUENT LINE FLOW METER REPLACEMENT**

**JULY 2012**



**GLENDALE**



*Exp. 3/31/13*

**CITY OF GLENDALE**

**ENGINEERING DEPARTMENT**

**5850 W. Glendale Avenue, Glendale, Arizona 85301 (623) 930-3630**

# PROJECT SPECIFICATIONS AND CONTRACT DOCUMENTS

## MAYOR

Elaine M. Scruggs

## COUNCIL MEMBERS

Norma S. Alvarez

Joyce V. Clark

Steven E. Frate

Yvonne J. Knaack

H. Philip Lieberman

Manuel D. Martinez

## ACTING CITY MANAGER

Horatio Skeete

## CITY CLERK

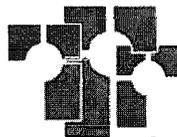
Pamela Hanna

## CITY ATTORNEY

Craig D. Tindall

## ACTING CITY ENGINEER

Gregory Rodzenko



GLENDAL  
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NOTICE TO CONTRACTORS

Sealed bids shall be either mailed to the City of Glendale Engineering Department, 5850 West Glendale Avenue, Glendale, Arizona, 85301, or hand-delivered to the Engineering Department office, third floor, 5850 West Glendale Avenue, Glendale, Arizona, for furnishing all plant, material, equipment and labor, and to complete construction of: **PROJECT NO. 111226 - ARROWHEAD RANCH WATER RECLAMATION FACILITY EFFLUENT LINE FLOW METER REPLACEMENT.**

Bids must be received by the Engineering Department of the City of Glendale no later than 2:00P.M., July 18, 2012. Any bid received after that time will not be considered and will be returned to the bidder.

Each bid shall be in accordance with the plans, specifications and contract documents, and shall be set forth and submitted on the BID DOCUMENTS included with the project specifications book. The BID DOCUMENTS may be removed from the project specifications book and submitted independently of such book.

The City of Glendale reserves the right to reject any or all bids or waive any informality or irregularity in a bid. No bidder may withdraw his bid for a period of fifty (50) days after opening and reading of the bids.

The City of Glendale is an equal opportunity employer and minority business enterprises and women's business enterprises are encouraged to submit bids.

CITY OF GLENDALE, ARIZONA

INFORMATION FOR BIDDERS

1. **ELIGIBILITY OF CONTRACTORS:** When calling for bids for contracts for public work to be performed on behalf of the State or any political subdivision thereof, which will be paid for from public funds, no bid shall be considered for performance of a contract, including construction work which is not submitted by a bidder duly licensed as a contractor in this State. No bid shall be awarded to any contractor or entity not authorized to do business in the State of Arizona by the Arizona Corporation Commission, as required by statute.

2. **PROPOSAL:** Bids to receive consideration shall be made in accordance with the following instructions:

(a) Before submitting a bid, bidders shall carefully examine the plans and specifications and contract documents, visit the site of the work, fully inform themselves as to all existing conditions and limitations.

(b) Bids shall be submitted on the "PROPOSAL" forms provided and delivered to the City of Glendale Engineering Department on or before the day and hour set in the "NOTICE TO CONTRACTORS," as published. Bids shall be enclosed in a sealed envelope marked on the outside lower right-hand corner indicating:

1. The bidder's name and address.
2. The project number.
3. The title of the project.
4. The time and date the bids are to be received.

(c) It is the sole responsibility of the bidder to see that his bid is received in proper time. Any bids received after the scheduled closing time for receipt of bids will be returned to the bidder unopened.

(d) The signatures of all persons shall be in longhand. Any interlineations, alterations, or erasures must be initialed by the signer of the bid.

(e) Bids shall not contain any recapitulations of the work to be done. No oral, telegraphic, telephonic, or modified proposals will be considered.

3. **WITHDRAWAL OF BID:** Any bidder may withdraw his bid, either personally, by telegram or by written request, at any time prior to the scheduled closing time for receipt of bids. No bid may be withdrawn by telephone. Any bid withdrawn will not be opened and will be returned to the bidder. After opening and reading of the bids, no bidder may withdraw his bid for a period of fifty (50) days from the date of opening and reading.

4. **LATE BIDS:** Bids received after the scheduled closing time for receipt of bids, as contained in the "Notice to Contractors," will not be considered and will be returned to the bidder.

5. **AWARD OR REJECTION OF BIDS:** The contract will be awarded to the lowest and best qualified responsive bidder complying with these instructions and with the "NOTICE TO CONTRACTORS." The City of Glendale, Arizona, however, reserves the right to accept or reject any or all bids or to waive any or all informalities or irregularities in the bid. Alternates may be accepted depending upon the availability of City funds. Accepted alternates will be considered in determining the lowest responsive and responsible bidder.

6. **BIDDERS INTERESTED IN MORE THAN ONE BID:** No person, firm or corporation shall be allowed to make, file, or be interested in more than one (1) bid for the same work unless alternate bids are called for in the specifications or any addenda. A person, firm, or corporation who has submitted a sub-proposal to a bidder, or who has quoted prices on materials to a bidder is not thereby disqualified from submitting a sub-proposal or quoting prices to other bidders.

7. **CONTRACT AND BONDS:** The form of contract, which the successful bidder as Contractor will be required to execute is included in the contract documents and should be carefully examined by the bidder. The successful bidder shall use the forms provided or such other forms as are acceptable by the City.

8. **INSURANCE REQUIREMENTS:** Contractor, and each Sub-contractor performing work or providing materials related to this Agreement must procure and maintain the insurance coverages described (collectively, "Contractor's Policies"), until each Parties' obligations under this Agreement are completed. Contractor must at all times relevant hereto carry a commercial general liability policy with a combined single limit of at least \$1,000,000 per occurrence and \$2,000,000 annual aggregate. **Contracts in excess of \$250,000 shall require \$2,000,000 single occurrence/\$5,000,000 annual aggregate.**

Sub-contractors must at all times relevant hereto carry a general commercial liability policy with a combined single limit of at least \$1,000,000 per occurrence.

This commercial general liability insurance must include independent contractors' liability, contractual liability, broad form property coverage, products and completed operations, XCU hazards if requested by the City, and a separation of insurance provision.

These limits may be met through a combination of primary and excess liability coverage.

**Auto.** A business auto policy providing a liability limit of at least \$1,000,000 per accident for Contractor and \$1,000,000 per accident for Sub-contractors and covering owned, non-owned and hired automobiles.

**Workers' Compensation and Employer's Liability.** A workers' compensation and employer's liability policy providing at least the minimum benefits required by Arizona law.

**Equipment Insurance.** Contractor must secure, pay for, and maintain all-risk insurance as necessary to protect the City against loss of owned, non-owned, rented or leased capital equipment and tools, equipment and scaffolding, staging, towers and forms owned or rented by Contractor or its Sub-contractors.

9. **SUBCONTRACTORS LISTING AND CERTIFICATION OF CONTRACT COMPLIANCE:** The contractor will be required to furnish the form of subcontractors listing and certification of contract compliance with the executed contract documents. This information is requested for tracking and insurance purposes only.

10. **INTERPRETATION OF PLANS AND DOCUMENTS:** If any person contemplating a bid for proposed contract is in doubt as to the true meaning of any part of the plans, specifications, or other proposed contract documents, or finds discrepancies in or omissions from the plans and

specifications, he may submit to the Engineering Department, a written request for an interpretation or correction thereof. The person submitting the request will be responsible for its prompt delivery. Questions received less than ninety-six (96) hours before the bid opening time may not be answered. Any interpretation or correction of the documents will be made only by Addendum, duly issued and a copy of such Addendum will be mailed or delivered to each person receiving a set of such documents. The City of Glendale will not be responsible for any other explanations or interpretations of the proposed documents.

11. CHANGES TO PLANS AND DOCUMENTS: Any changes to the plans and documents shall be made only by Addendum. No verbal or other changes to the plans and documents will be valid. A copy of each Addendum will be mailed or delivered as provided in Section 12 below.

12. ADDENDUM: Any addenda will be faxed, mailed or delivered to all who are known by the City to have received a complete set of bid documents, and to offices where bid documents have been filed for review purposes. It is the responsibility of each bidder to ascertain that he has received all addenda issued by telephoning the office identified in the NOTICE TO CONTRACTORS as the location where bid documents are available prior to submitting his bid.

Bidders shall acknowledge all addenda in the appropriate location on the "PROPOSAL" form. Failure to acknowledge receipt of Addenda shall render the bid proposal non-responsive and it will be rejected.

13. ASSIGNMENT OF CONTRACT: No assignment by the Contractor of any contract to be entered into hereunder, or any part thereof, or of funds to be received thereunder by the Contractor, will be recognized by the Owner by the Owner unless such assignment has had prior approval of the Owner and consented thereto in writing.

14. PLANS AND SPECIFICATIONS TO SUCCESSFUL BIDDER: The successful bidder may obtain five (5) sets of plans and specifications for this project from the City.

15. TIME OF COMPLETION: The Contractor shall commence work under this project on or before the tenth day following receipt of the Notice to Proceed for that project from the City of Glendale and shall fully complete all work under the project within Ninety (90) consecutive calendar days from and including the date of receipt of such Notice to Proceed. Time is of the essence in the completion of all work required under this contract. The Contractor shall, at all times, during the continuance of the contract, prosecute the work with such force and equipment as is sufficient to complete all work within the time specified.

16. CITY OF GLENDALE TRANSACTION PRIVILEGE TAX: The City of Glendale transaction privilege tax shall **NOT** be waived under the provisions of this contract. The current privilege tax rate can be obtained from the City of Glendale Sales Tax and Licenses Department. The Contractor shall be responsible for reporting and payment of all city, county, state or federal taxes.

17. ALTERNATES: Alternate proposals will not be considered unless called for in the documents or any addenda thereto. When alternates are requested, all requested alternates or alternate bid items, unless otherwise stated, shall be bid. If no change in the base bid will occur with the alternate, enter "No Change."

18. APPROVAL OF SUBSTITUTIONS: The materials, products and equipment described in the

Documents and Addenda establish a standard or required function, dimension, appearance and quality to be met by any proposed substitution. No substitute will be considered, before bid opening, unless written request for approval has been received by the City Engineer at least ten (10) working days prior to the scheduled closing time for receipt of bids. Each such request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including any drawings, cuts, performance and test data and any other information necessary for evaluation of the substitute. Bidder shall not be entitled to approval of a substitute.

If a substitute is approved, the approval shall be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner.

19. USE OF "EQUALS": When the specifications for materials, articles, products and equipment state "or equal," contractor may bid upon, and use materials, articles, products and equipment which will perform equally the duties imposed by the general design. The City Engineering Department will have the final approval of all materials, articles, products and equipment proposed to be used as an "equal." It shall not be purchased or installed without the prior written approval from the City Engineering Department.

Approvals for "equals," before bid opening, may be requested in writing to the City Engineering Department for approval. Requests must be received at least ten (10) days prior to the date set for opening the Bid Proposals. The request shall state the name of the material, article, product or equipment for which the item is sought to be considered an equal and a complete description of the proposed equal including any drawings, cuts, performance and test data and any other information necessary for approval of the equal. All approvals will be issued in the form of an addendum.

20. EXAMINATION OF CONTRACT DOCUMENTS AND VISIT SITE: Before submitting a Bid Proposal, bidders should carefully examine the Contract Documents, visit the site of the work, fully inform themselves as to all existing conditions and limitations. No consideration will be granted for any alleged misunderstanding of the material, articles or piece of equipment to be furnished or work to be done. It is understood that the tender of the Bid Proposal carries with it the agreement to all items and conditions referred to herein or indicated in the Contract Documents.

21. BIDDERS IN DEFAULT: No bid will be awarded to any person, firm or corporation that is not authorized by the Arizona Corporation Commission to do business in the State of Arizona, in arrears or is in default to the City of Glendale upon any debt or contract, or that is a defaulter as surety or otherwise upon any obligation to the City of Glendale, or has failed to faithfully perform any previous contract with the City of Glendale.

\*\*\*END OF INFORMATION FOR BIDDERS\*\*\*

PROPOSAL

Place Glendale, AZ

Date July 18, 2012

Proposal of FELIX CONSTRUCTION Co., a Corporation organized and existing under the laws of the State of Arizona. a partnership consisting of \_\_\_\_\_; or an individual trading as \_\_\_\_\_.

TO THE HONORABLE MAYOR AND COUNCIL  
CITY OF GLENDALE  
GLENDALE, ARIZONA

Gentlemen:

The undersigned hereby proposes and agrees to furnish any and all required labor, materials, construction equipment, transportation and services for the construction of: **PROJECT 111226-ARROWHEAD RANCH WATER RECLAMATION FACILITY EFFLUENT LINE FLOW METER REPLACEMENT**, in strict conformity with the plans and specifications for the following unit prices:

(Extension of these unit prices on the basis of estimated quantities and the totaling of these extensions are for the purpose of comparing bids only. The mathematics of such extensions and totaling will be checked and corrected by the Public Works/Engineering Department, before evaluating the bids, and the lowest of such corrected and checked totals will determine the lowest bids.)

**Base Bid - Remove and Replace Effluent Line Flow Meter:**

The undersigned agrees to perform the work as described in the Contract Documents for the following lump sum price:

TEN THOUSAND TWO HUNDRED FORTY SIX AND 00/100  
(Written)

DOLLARS ( \$ 10,246.00 ).  
(Figures)

**Construction Contingency:**

Add TWO THOUSAND TWO HUNDRED AND FIFTY AND 00/100  
(Written)

Dollars (\$ 2,250.00 )

**Total Bid including Contingency:**

TWELVE THOUSAND FOUR HUNDRED NINETY SIX AND 00/100  
(Written)

DOLLAR (\$) \$ 12,496.00 ).  
(Figures)

NOTE: IN CASE OF DISCREPANCY, THE AMOUNT SHOWN IN WORDS SHALL GOVERN.

The undersigned hereby declares that he has visited the site(s) and has carefully examined the contract documents relating to the work covered by the above bid or bids.

Upon receipt of notice of the acceptance of this bid, we will execute the formal contract attached within ten (10) days, and will deliver the Certificate of Insurance.

The undersigned has checked carefully all the above figures and understands that the City of Glendale, Arizona, will not be responsible for any errors or omissions on the part of the undersigned in making up this bid.

The undersigned understands that the Mayor and Council of the City of Glendale, Arizona, reserves the right to reject any or all bids or to waive any informalities or irregularities in the bid.

Respectfully submitted,

Arizona Contractor's  
Classification and  
License No. (SEE ATTACHED)

FELIX CONSTRUCTION COMPANY  
Contractor

Project 111226

By Kevin Felix KEVIN FELIX, SECRETARY

8

FELIX CONSTRUCTION COMPANY

1326 W. INDUSTRIAL DR, COOLIDGE, AZ 85128  
(Complete business address)

Telephone Number: 480-464-0011

Fax Number 480-464-0078

Bidder shall signify receipt of all Addenda here (if any):

NONE RECEIVED, DID RECEIVE E-MAIL DATED 7/9/12 CHANGING METER

SIZE FROM 16" TO 18"

Failure to acknowledge receipt of all Addenda shall render the bid proposal non-responsive and will be rejected.

Acknowledged by

Kevin Felix



## CONSTRUCTION AGREEMENT

This Construction Agreement ("Agreement") is entered into and effective between the CITY OF GLENDALE, an Arizona municipal corporation ("City"), and Felix Construction Company, an Arizona corporation ("Contractor") as of the 28 day of August, 2012.

### RECITALS

- A. City intends to undertake a project for the benefit of the public and with public funds that is more fully set forth in the **Notice to Contractors** and the attached **Exhibit A** ("Project");
- B. City desires to retain the services of Contractor to perform those specific duties and produce the specific work as set forth in the Project, the plans and specifications, the **Information for Bidders**, and the **Maricopa Association of Governments ("MAG") General and Supplemental Conditions and Provisions**;
- C. City and Contractor desire to memorialize their agreement with this document.

### AGREEMENT

In consideration of the Recitals, which are confirmed as true and correct and incorporated by this reference, the mutual promises and covenants contained in this Agreement, and other good and valuable consideration, City and Contractor agree as follows:

#### 1. Project.

- 1.1 **Scope.** Contractor will provide all services and material necessary to assure the Project is completed timely and efficiently consistent with Project requirements, including, but not limited to, working in close interaction and interfacing with City and its designated employees, and working closely with others, including other contractors, providers or consultants retained by City.
- 1.2 **Documents.** The following documents are, by this reference, entirely incorporated into this Agreement and attached Exhibits as though fully set forth herein:
  - (A) Notice to Contractors;
  - (B) Information for Bidders;
  - (C) MAG General Conditions, Supplemental General Conditions, Special and Technical Provisions;
  - (D) Proposal;
  - (E) Bid Bond;
  - (F) Payment Bond;
  - (G) Performance Bond;
  - (H) Certificate of Insurance;
  - (I) Appendix; and
  - (J) Plans and Addenda thereto.

Should a conflict exist between this Agreement (and its attachments), and any of the incorporated documents as listed above, the provisions of this Agreement shall govern.

#### 1.3 Project Team.

- (A) **Project Manager.** Contractor will designate an employee as Project Manager with sufficient training, knowledge, and experience to, in the City's opinion, to complete the project and handle all aspects of the Project such that the work produced by Contractor is consistent with applicable standards as detailed in this Agreement.
- (B) **Project Team.**
  - (1) The Project manager and all other employees assigned to the project by Contractor will comprise the "Project Team."
  - (2) Project Manager will have responsibility for and will supervise all other employees assigned to the project by Contractor

(C) Sub-contractors.

- (1) Contractor may engage specific technical contractor (each a "Sub-contractor") to furnish certain service functions.
- (2) Contractor will remain fully responsible for Sub-contractor's services.
- (3) Sub-contractors must be approved by the City, unless the Sub-contractor was previously mentioned in the response to the solicitation.
- (4) Contractor shall certify by letter that contracts with Sub-contractors have been executed incorporating requirements and standards as set forth in this Agreement.

2. **Schedule.** The Project will be undertaken in a manner that ensures it is completed in a timely and efficient manner. If not otherwise stated in **Exhibit A**, the Project shall be completed by no later than within Ninety (90) consecutive calendar days from and including the date of receipt of the Notice to Proceed.

3. **Contractor's Work.**

3.1 **Standard.** Contractor must perform services in accordance with the standards of due diligence, care, and quality prevailing among contractors having substantial experience with the successful furnishing of services and materials for projects that are equivalent in size, scope, quality, and other criteria under the Project and identified in this Agreement.

3.2 **Licensing.** Contractor warrants that:

- (A) Contractor and Sub-contractors will hold all appropriate and required licenses, registrations and other approvals necessary for the lawful furnishing of services ("Approvals"); and
- (B) Neither Contractor nor any Sub-contractor has been debarred or otherwise legally excluded from contracting with any federal, state, or local governmental entity ("Debarment").
  - (1) City is under no obligation to ascertain or confirm the existence or issuance of any Approvals or Debarments or to examine Contractor's contracting ability.
  - (2) Contractor must notify City immediately if any Approvals or Debarment changes during the Agreement's duration and the failure of the Contractor to notify City as required will constitute a material default of this Agreement

3.3 **Compliance.** Services and materials will be furnished in compliance with applicable federal, state, county and local statutes, rules, regulations, ordinances, building codes, life safety codes, or other standards and criteria designated by City.

3.4 **Coordination; Interaction.**

- (A) If the City determines that the Project requires the coordination of professional services or other providers, Contractor will work in close consultation with City to proactively interact with any other contractors retained by City on the Project ("Coordinating Entities").
- (B) Subject to any limitations expressly stated in the budget, Contractor will meet to review the Project, schedules, budget, and in-progress work with Coordinating Entities and the City as often and for durations as City reasonably considers necessary in order to ensure the timely work delivery and Project completion.
- (C) If the Project does not involve Coordinating Entities, Contractor will proactively interact with any other contractors when directed by City to obtain or disseminate timely information for the proper execution of the Project.

3.5 **Hazardous Substances.** Contractor is responsible for the appropriate handling, disposal of, and if necessary, any remediation and all losses and damages to the City, associated with the use or release of hazardous substances by Contractor in connection with completion of the Project.

3.6 **Warranties.** At any time within two years after completion of the Project, Contractor must, at

Contractor's sole expense and within 20 days of written notice from the City, uncover, correct and remedy all defects in Contractor's work. City will accept a manufacturer's warranty on approved equipment as satisfaction of the Contractor's warranty under this subsection

- 3.7. **Bonds.** Upon execution of this Agreement, and if applicable, Contractor must furnish Payment and Performance bonds as required under A.R.S. § 34-608.

4. **Compensation for the Project.**

- 4.1 **Compensation.** Contractor's compensation for the Project, including those furnished by its Sub-contractors will not exceed \$12,496.00, as specifically detailed in the Contractor's bid and set forth in Exhibit B ("Compensation")

- 4.2 **Change in Scope of Project.** The Compensation may be equitably adjusted if the originally contemplated scope of services as outlined in the Project is significantly modified by the City.

- (A) Adjustments to the Scope or Compensation require a written amendment to this Agreement and may require City Council approval.
- (B) Additional services which are outside the scope of the Project and not contained in this Agreement may not be performed by the Contractor without prior written authorization from the City.

5. **Billings and Payment.**

5.1 **Applications.**

- (A) The Contractor will submit monthly invoices (each, a "Payment Application") to City's Project Manager and City will remit payments based upon the Payment Application as stated below.
- (B) The period covered by each Payment Application will be one calendar month ending on the last day of the month.

5.2 **Payment.**

- (A) After a full and complete Payment Application is received, City will process and remit payment within 30 days.
- (B) Payment may be subject to or conditioned upon City's receipt of:
- (1) Completed work generated by Contractor and its Sub-contractors; and
- (2) Unconditional waivers and releases on final payment from Sub-contractors as City may reasonably request to assure the Project will be free of claims arising from required performances under this Agreement.

5.3 **Review and Withholding.** City's Project Manager will timely review and certify Payment Applications.

- (A) If the Payment Application is rejected, the Project Manager will issue a written listing of the items not approved for payment.
- (B) City may withhold an amount sufficient to pay expenses that City reasonably expects to incur in correcting the deficiency or deficiencies rejected for payment.
- (C) Contractor will provide, by separate cover, and concurrent with the execution of this Agreement, all required financial information to the City, including City of Glendale Transaction Privilege License and Federal Taxpayer identification numbers.
- (D) City will temporarily withhold Compensation amounts as required by A.R.S. 34-221(C).

6. **Termination.**

- 6.1 **For Convenience.** City may terminate this Agreement for convenience, without cause, by delivering a

written termination notice stating the effective termination date, which may not be less than 15 days following the date of delivery

- (A) Contractor will be equitably compensated any services and materials furnished prior to receipt of the termination notice and for reasonable costs incurred.
- (B) Contractor will also be similarly compensated for any approved effort expended and approved costs incurred that are directly associated with Project closeout and delivery of the required items to the City.

**6.2 For Cause.** City may terminate this Agreement for cause if Contractor fails to cure any breach of this Agreement within seven days after receipt of written notice specifying the breach.

- (A) Contractor will not be entitled to further payment until after City has determined its damages. If City's damages resulting from the breach, as determined by City, are less than the equitable amount due but not paid Contractor for Service and Repair furnished, City will pay the amount due to Contractor, less City's damages.
- (B) If City's direct damages exceed amounts otherwise due to Contractor, Contractor must pay the difference to City immediately upon demand; however, Contractor will not be subject to consequential damages more than \$1,000,000 or the amount of this Agreement, whichever is greater.

## 7. Insurance.

**7.1 Requirements.** Contractor must obtain and maintain the following insurance ("Required Insurance"):

- (A) Contractor and Sub-contractors. Contractor, and each Sub-contractor performing work or providing materials related to this Agreement must procure and maintain the insurance coverages described below (collectively, "Contractor's Policies"), until each Parties' obligations under this Agreement are completed.
- (B) General Liability.
  - (1) Contractor must at all times relevant hereto carry a commercial general liability policy with a combined single limit of at least \$1,000,000 per occurrence and \$2,000,000 annual aggregate.
  - (2) Sub-contractors must at all times relevant hereto carry a general commercial liability policy with a combined single limit of at least \$1,000,000 per occurrence.
  - (3) This commercial general liability insurance must include independent contractors' liability, contractual liability, broad form property coverage, products and completed operations, XCU hazards if requested by the City, and a separation of insurance provision.
  - (4) These limits may be met through a combination of primary and excess liability coverage.
- (C) Auto. A business auto policy providing a liability limit of at least \$1,000,000 per accident for Contractor and 1,000,000 per accident for Sub-contractors and covering owned, non-owned and hired automobiles.
- (D) Workers' Compensation and Employer's Liability. A workers' compensation and employer's liability policy providing at least the minimum benefits required by Arizona law.
- (E) Equipment Insurance. Contractor must secure, pay for, and maintain all-risk insurance as necessary to protect the City against loss of owned, non-owned, rented or leased capital equipment and tools, equipment and scaffolding, staging, towers and forms owned or rented by Contractor or its Sub-contractors
- (F) Notice of Changes. Contractor's Policies must provide for not less than 30 days' advance written notice to City Representative of:

- (1) Cancellation or termination of Contractor or Sub-contractor's Policies;
- (2) Reduction of the coverage limits of any of Contractor or and Sub-contractor's Policies; and
- (3) Any other material modification of Contractor or Sub-contractor's Policies related to this Agreement.

(G) Certificates of Insurance.

- (1) Within 10 business days after the execution of the Agreement, Contractor must deliver to City Representative certificates of insurance for each of Contractor and Sub-contractor's Policies, which will confirm the existence or issuance of Contractor and Sub-contractor's Policies in accordance with the provisions of this section, and copies of the endorsements of Contractor and Sub-contractor's Policies in accordance with the provisions of this section.
- (2) City is and will be under no obligation either to ascertain or confirm the existence or issuance of Contractor and Sub-contractor's Policies, or to examine Contractor and Sub-contractor's Policies, or to inform Contractor or Sub-contractor in the event that any coverage does not comply with the requirements of this section.
- (3) Contractor's failure to secure and maintain Contractor Policies and to assure Sub-contractor policies as required will constitute a material default under this Agreement.

(H) Other Contractors or Vendors.

- (1) Other contractors or vendors that may be contracted by Contractor with in connection with the Project must procure and maintain insurance coverage as is appropriate to their particular agreement.
- (2) This insurance coverage must comply with the requirements set forth above for Contractor's Policies (e.g., the requirements pertaining to endorsements to name the parties as additional insured parties and certificates of insurance).

(I) Policies. Except with respect to workers' compensation and employer's liability coverages, the City must be named and properly endorsed as additional insureds on all liability policies required by this section.

- (1) The coverage extended to additional insureds must be primary and must not contribute with any insurance or self insurance policies or programs maintained by the additional insureds.
- (2) All insurance policies obtained pursuant to this section must be with companies legally authorized to do business in the State of Arizona and acceptable to all parties.

**7.2 Sub-contractors.**

- (A) Contractor must also cause its Sub-contractors to obtain and maintain the Required Insurance.
- (B) City may consider waiving these insurance requirements for a specific Sub-contractor if City is satisfied the amounts required are not commercially available to the Sub-contractor and the insurance the Sub-contractor does have is appropriate for the Sub-contractor's work under this Agreement.
- (C) Contractor and Sub-contractors must provide to the City proof of Required Insurance whenever requested

**7.3 Indemnification.**

- (A) To the fullest extent permitted by law, Contractor must defend, indemnify, and hold harmless City and its elected officials, officers, employees and agents (each, an "Indemnified Party," collectively, the "Indemnified Parties"), for, from, and against any and all claims, demands, actions, damages, judgments, settlements, personal injury (including sickness, disease, death,

and bodily harm), property damage (including loss of use), infringement, governmental action and all other losses and expenses, including attorneys' fees and litigation expenses (each, a "Demand or Expense"; collectively, "Demands or Expenses") asserted by a third-party (i.e. a person or entity other than City or Contractor) and that arises out of or results from the breach of this Agreement by the Contractor or the Contractor's negligent actions, errors or omissions (including any Sub-contractor or other person or firm employed by Contractor), whether sustained before or after completion of the Project.

- (B) This indemnity and hold harmless provision applies even if a Demand or Expense is in part due to the Indemnified Party's negligence or breach of a responsibility under this Agreement, but in that event, Contractor shall be liable only to the extent the Demand or Expense results from the negligence or breach of a responsibility of Contractor or of any person or entity for whom Contractor is responsible.
- (C) Contractor is not required to indemnify any Indemnified Parties for, from, or against any Demand or Expense resulting from the Indemnified Party's sole negligence or other fault solely attributable to the Indemnified Party.

7.4 **Waiver of Subrogation.** Contractor waives, and will require any Subcontractor to waive, all rights of subrogation against the City to the extent of all losses or damages covered by any policy of insurance.

## 8. Immigration Law Compliance.

- 8.1 Contractor, and on behalf any subcontractor, warrants, to the extent applicable under A.R.S. § 41-4401, compliance with all federal immigration laws and regulations that relate to their employees as well as compliance with A.R.S. § 23-214(A) which requires registration and participation with the E-Verify Program.
- 8.2 Any breach of warranty under subsection 8.1 above is considered a material breach of this Agreement and is subject to penalties up to and including termination of this Agreement.
- 8.3 City retains the legal right to inspect the papers of any Contractor or subcontractor employee who performs work under this Agreement to ensure that the Contractor or any subcontractor is compliant with the warranty under subsection 8.1 above.
- 8.4 City may conduct random inspections, and upon request of City, Contractor shall provide copies of papers and records of Contractor demonstrating continued compliance with the warranty under subsection 9.1 above. Contractor agrees to keep papers and records available for inspection by the City during normal business hours and will cooperate with City in exercise of its statutory duties and not deny access to its business premises or applicable papers or records for the purposes of enforcement of this section 9.
- 8.5 Contractor agrees to incorporate into any subcontracts under this Agreement the same obligations imposed upon Contractor and expressly accrue those obligations directly to the benefit of the City. Contractor also agrees to require any subcontractor to incorporate into each of its own subcontracts under this Agreement the same obligations above and expressly accrue those obligations to the benefit of the City.
- 8.6 Contractor's warranty and obligations under this section to the City is continuing throughout the term of this Agreement or until such time as the City determines, in its sole discretion, that Arizona law has been modified in that compliance with this section is no longer a requirement.
- 8.7 The "E-Verify Program" above means the employment verification program administered by the United States Department of Homeland Security, the Social Security Administration, or any successor program.

9. **Conflict.** Contractor acknowledges this Agreement is subject to A.R.S. § 38-511, which allows for cancellation of this Agreement in the event any person who is significantly involved in initiating, negotiating, securing, drafting, or creating the Agreement on City's behalf is also an employee, agent, or consultant of any other party to this Agreement.

10. **Prohibitions.** Contractor certifies under A.R.S. §§ 35-391 *et seq* and 35-393 *et seq*, that it does not have, and during the term of this Agreement will not have "scrutinized" business operations, as defined in the preceding statutes, in the countries of Sudan or Iran.

11. **Non-Discrimination Policies.** Contractor must not discriminate against any employee or applicant for employment on the basis of race, religion, color sex or national origin Contractor must develop, implement and maintain non-discrimination policies and post the policies in conspicuous places visible to employees and applicants for employment. Contractor will require any Sub-contractor to be bound to the same requirements as stated within this section.

12. **Notices.**

12.1 A notice, request or other communication that is required or permitted under this Agreement (each a "Notice") will be effective only if:

- (A) The Notice is in writing, and
- (B) Delivered in person or by private express overnight delivery service (delivery charges prepaid), certified or registered mail (return receipt requested).
- (C) Notice will be deemed to have been delivered to the person to whom it is addressed as of the date of receipt, if:
  - (1) Received on a business day, or before 5:00 p.m., at the address for Notices identified for the Party in this Agreement by U.S. Mail, hand delivery, or overnight courier on or before 5:00 p.m.; or
  - (2) As of the next business day after receipt, if received after 5:00 p.m.
- (D) The burden of proof of the place and time of delivery is upon the Party giving the Notice.
- (E) Digitalized signatures and copies of signatures will have the same effect as original signatures.

12.2 **Representatives.**

(A) Contractor. Contractor's representative ("Contractor's Representative") authorized to act on Contractor's behalf with respect to the Project, and his or her address for Notice delivery is:

Kevin Felix  
Felix Construction Company  
1326 W. Industrial Drive  
Coolidge, AZ 85128

(B) City. City's representative ("City's Representative") authorized to act on City's behalf, and his or her address for Notice delivery is:

City of Glendale  
Attn: Jayme Chapin  
5850 West Glendale Avenue  
Glendale, Arizona 85301

With required copies to:

City of Glendale  
City Manager  
5850 West Glendale Avenue  
Glendale, Arizona 85301

City of Glendale  
City Attorney  
5850 West Glendale Avenue  
Glendale, Arizona 85301

(C) Concurrent Notices.

- (1) All notices to City's representative must be given concurrently to City Manager and City Attorney.
- (2) A notice will not be considered to have been received by City's representative until the time that it has also been received by City Manager and City Attorney.

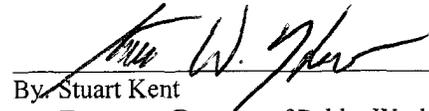
- (3) City may appoint one or more designees for the purpose of receiving notice by delivery of a written notice to Contractor identifying the designee(s) and their respective addresses for notices.
  - (D) **Changes.** Contractor or City may change its representative or information on Notice, by giving Notice of the change in accordance with this section at least ten days prior to the change
- 13. **Financing Assignment.** City may assign this Agreement to any City-affiliated entity, including a non-profit corporation or other entity whose primary purpose is to own or manage the Project
- 14. **Entire Agreement; Survival; Counterparts; Signatures.**
  - 14.1 **Integration.** This Agreement contains, except as stated below, the entire agreement between City and Contractor and supersedes all prior conversations and negotiations between the parties regarding the Project or this Agreement
    - (A) Neither Party has made any representations, warranties or agreements as to any matters concerning the Agreement's subject matter
    - (B) Representations, statements, conditions, or warranties not contained in this Agreement will not be binding on the parties.
    - (C) Any solicitation, addendums and responses submitted by the Contractor are incorporated fully into this Agreement as Exhibit A Any inconsistency between Exhibit A and this Agreement will be resolved by the terms and conditions stated in this Agreement
  - 14.2 **Interpretation.**
    - (A) The parties fairly negotiated the Agreement's provisions to the extent they believed necessary and with the legal representation they deemed appropriate
    - (B) The parties are of equal bargaining position and this Agreement must be construed equally between the parties without consideration of which of the parties may have drafted this Agreement
    - (C) The Agreement will be interpreted in accordance with the laws of the State of Arizona
  - 14.3 **Survival.** Except as specifically provided otherwise in this Agreement each warranty, representation, indemnification and hold harmless provision, insurance requirement, and every other right, remedy and responsibility of a Party, will survive completion of the Project, or the earlier termination of this Agreement
  - 14.4 **Amendment.** No amendment to this Agreement will be binding unless in writing and executed by the parties Any amendment may be subject to City Council approval
  - 14.5 **Remedies.** All rights and remedies provided in this Agreement are cumulative and the exercise of any one or more right or remedy will not affect any other rights or remedies under this Agreement or applicable law
  - 14.6 **Severability.** If any provision of this Agreement is voided or found unenforceable, that determination will not affect the validity of the other provisions, and the voided or unenforceable provision will be reformed to conform to applicable law.
  - 14.7 **Counterparts.** This Agreement may be executed in counterparts, and all counterparts will together comprise one instrument
- 15. **Dispute Resolution.** Each claim, controversy and dispute ("Dispute") between Contractor and City will be resolved in accordance with Exhibit C The final determination will be made by the City

16. **Exhibits.** The following exhibits, with reference to the term in which they are first referenced, are incorporated by this reference

Exhibit A	Project
Exhibit B	Compensation
Exhibit C	Dispute Resolution

The parties enter into this Agreement as of the date shown above

City of Glendale,  
an Arizona municipal corporation

  
By: Stuart Kent  
Its Executive Director of Public Works

ATTEST

  
City Clerk (SEAL)

APPROVED AS TO FORM

  
City Attorney

FELIX CONSTRUCTION COMPANY  
an Arizona corporation

  
By: Kevin Felix  
Its Director

WOMEN-OWNED/MINORITY BUSINESS  YES  NO  
CITY OF GLENDALE TRANSACTION PRIVILEGE TAX NO \_\_\_\_\_  
FEDERAL TAXPAYER IDENTIFICATION NO \_\_\_\_\_

**EXHIBIT A  
CONSTRUCTION AGREEMENT**

**PROJECT**

The purpose of this project is to remove the existing effluent flow meter at the Arrowhead Ranch Water Reclamation Facility and replace in kind

**EXHIBIT B  
CONSTRUCTION AGREEMENT**

**COMPENSATION**

**METHOD AND AMOUNT OF COMPENSATION**

By bid, including all services, materials and costs

**NOT-TO-EXCEED AMOUNT**

The total amount of compensation paid to Contractor for full completion of all work required by the Project during the entire term of the Project must not exceed \$12,496.00

**DETAILED PROJECT COMPENSATION**

Per Page 7 of the Bid Schedule

**EXHIBIT C  
CONSTRUCTION AGREEMENT**

**DISPUTE RESOLUTION**

**1. Disputes.**

- 1 1 Commitment The parties commit to resolving all disputes promptly, equitably, and in a good-faith, cost-effective manner
- 1 2 Application The provisions of this Exhibit will be used by the parties to resolve all controversies, claims, or disputes ("Dispute") arising out of or related to this Agreement-including Disputes regarding any alleged breaches of this Agreement
- 1 3 Initiation A party may initiate a Dispute by delivery of written notice of the Dispute, including the specifics of the Dispute, to the Representative of the other party as required in this Agreement
- 1 4 Informal Resolution When a Dispute notice is given, the parties will designate a member of their senior management who will be authorized to expeditiously resolve the Dispute.
- (A) The parties will provide each other with reasonable access during normal business hours to any and all non-privileged records, information and data pertaining to any Dispute in order to assist in resolving the Dispute as expeditiously and cost effectively as possible,
- (B) The parties' senior managers will meet within 10 business days to discuss and attempt to resolve the Dispute promptly, equitably, and in a good faith manner, and
- (C) The Senior Managers will agree to subsequent meetings if both parties agree that further meetings are necessary to reach a resolution of the Dispute

**2. Arbitration.**

- 2 1 Rules If the parties are unable to resolve the Dispute by negotiation within 30 days from the Dispute notice, and unless otherwise informal discussions are extended by the mutual agreement, the Dispute will be decided by binding arbitration in accordance with Construction Industry Rules of the AAA, as amended herein. Although the arbitration will be conducted in accordance with AAA Rules, it will not be administered by the AAA, but will be heard independently
- (A) The parties will exercise best efforts to select an arbitrator within 5 business days after agreement for arbitration. If the parties have not agreed upon an arbitrator within this period, the parties will submit the selection of the arbitrator to one of the principals of the mediation firm of Scott & Skelly, LLC, who will then select the arbitrator. The parties will equally share the fees and costs incurred in the selection of the arbitrator
- (B) The arbitrator selected must be an attorney with at least 15 years experience with commercial construction legal matters in Maricopa County, Arizona, be independent, impartial, and not have engaged in any business for or adverse to either Party for at least 10 years.
- 2.2 Discovery The extent and the time set for discovery will be as determined by the arbitrator. Each Party must, however, within ten (10) days of selection of an arbitrator deliver to the other Party copies of all documents in the delivering party's possession that are relevant to the dispute
- 2 3 Hearing The arbitration hearing will be held within 90 days of the appointment of the arbitrator. The arbitration hearing, all proceedings, and all discovery will be conducted in Glendale, Arizona unless otherwise agreed by the parties or required as a result of witness location. Telephonic hearings and other reasonable arrangements may be used to minimize costs
- 2 4 Award At the arbitration hearing, each Party will submit its position to the arbitrator, evidence to support that position, and the exact award sought in this matter with specificity. The arbitrator must select the award sought by one of the parties as the final judgment and may not independently alter or modify the awards sought by the parties, fashion any remedy, or make any equitable order. The arbitrator has no authority to consider or award punitive damages

- 2.5 Final Decision The Arbitrator's decision should be rendered within 15 days after the arbitration hearing is concluded. This decision will be final and binding on the Parties.
- 2.6 Costs The prevailing party may enter the arbitration in any court having jurisdiction in order to convert it to a judgment. The non-prevailing party shall pay all of the prevailing party's arbitration costs and expenses, including reasonable attorney's fees and costs.
3. **Services to Continue Pending Dispute.** Unless otherwise agreed to in writing, Contractor must continue to perform and maintain progress of required services during any Dispute resolution or arbitration proceedings, and City will continue to make payment to Contractor in accordance with this Agreement.
4. **Exceptions.**
- 4.1 Third Party Claims City and Contractor are not required to arbitrate any third-party claim, cross-claim, counter claim, or other claim or defense of a third-party who is not obligated by contract to arbitrate disputes with City and Contractor.
- 4.2 Liens City or Contractor may commence and prosecute a civil action to contest a lien or stop notice, or enforce any lien or stop notice, but only to the extent the lien or stop notice the Party seeks to enforce is enforceable under Arizona Law, including, without limitation, an action under A.R.S. § 33-420, without the necessity of initiating or exhausting the procedures of this Exhibit.
- 4.3 Governmental Actions This Exhibit does not apply to, and must not be construed to require arbitration of, any claims, actions or other process filed or issued by City of Glendale Building Safety Department or any other agency of City acting in its governmental permitting or other regulatory capacity.



**b. Deductible Clause**

- (1) Our obligation to pay damages on your behalf applies only to the amount of damages for each "occurrence" which are in excess of the deductible amount stated in Section B. Limits of Insurance, 6. Voluntary Property Damage and Care, Custody or Control Liability Coverage of this endorsement. The limits of insurance will not be reduced by the application of such deductible amount
- (2) Condition 2. Duties in the Event of Occurrence, Offense, Claim or Suit, applies to each claim or "suit" irrespective of the amount
- (3) We may pay any part or all of the deductible amount to effect settlement of any claim or "suit" and, upon notification of the action taken, you shall promptly reimburse us for such part of the deductible amount as has been paid by us.

**7. 180 Day Coverage for Newly Formed or Acquired Organizations**

**SECTION II - WHO IS AN INSURED** is amended as follows

Subparagraph a. of Paragraph 4. is hereby deleted and replaced by the following.

- a. Insurance under this provision is afforded only until the 180th day after you acquire or form the organization or the end of the policy period, whichever is earlier,

→ **8. Waiver of Subrogation**

**SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS, 9. Transfer of Rights of Recovery Against Others to Us** is hereby amended by the addition of the following

We waive any right of recovery we may have because of payments we make for injury or damage arising out of your ongoing operations or "your work" done under a written contract requiring such waiver with that person or organization and included in the "products-completed operations hazard". However, our rights may only be waived prior to the "occurrence" giving rise to the injury or damage for which we make payment under this Coverage Part. The insured must do nothing after a loss to impair our rights. At our request, the insured will bring "suit" or transfer those rights to us and help us enforce those rights

→ **9. Automatic Additional Insured - Specified Relationships**

a. The following is hereby added to **SECTION II - WHO IS AN INSURED**

- (1) Any person or organization described in Paragraph 9.a.(2) below (hereinafter referred to as additional insured) whom you are required to add as an additional insured under this Coverage Part by reason of

- (a) A written contract or agreement, or
- (b) An oral agreement or contract where a certificate of insurance showing that person or organization as an additional insured has been issued,

is an insured, provided

- (a) The written or oral contract or agreement is

- 1) Currently in effect or becomes effective during the policy period, and
- 2) Executed prior to an "occurrence" or offense to which this insurance would apply, and

- (b) They are not specifically named as an additional insured under any other provision of, or endorsement added to, this Coverage Part.

- (2) Only the following persons or organizations are additional insureds under this endorsement, and insurance coverage provided to such additional insureds is limited as provided herein:

- (a) The manager or lessor of a premises leased to you with whom you have agreed per Paragraph 9.a.(1) above to provide insurance, but only with respect to liability arising out of the ownership, maintenance or use of that part of a premises leased to you, subject to the following additional exclusions

This insurance does not apply to

- 1) Any "occurrence" which takes place after

you cease to be a tenant in that premises

- 2) Structural alterations, new construction or demolition operations performed by or on behalf of such additional insured
- (b) Any person or organization from which you lease equipment with whom you have agreed per Paragraph 9.a.(1) above to provide insurance. Such person(s) or organization(s) are insureds solely with respect to their liability arising out of the maintenance, operation or use by you of equipment leased to you by such person(s) or organization(s). However, this insurance does not apply to any "occurrence" which takes place after the equipment lease expires
- (c) Any person or organization (referred to below as vendor) with whom you have agreed per Paragraph 9.a.(1) above to provide insurance, but only with respect to "bodily injury" or "property damage" arising out of "your products" which are distributed or sold in the regular course of the vendor's business, subject to the following additional exclusions
- 1) The insurance afforded the vendor does not apply to
    - a) "Bodily injury" or "property damage" for which the vendor is obligated to pay damages by reason of the assumption of liability in a contract or agreement. This exclusion does not apply to liability for damages that the vendor would have in the absence of the contract or agreement,
    - b) Any express warranty unauthorized by you,
    - c) Any physical or chemical change in the product made intentionally by the vendor,
    - d) Repackaging, unless unpacked solely for the purpose of inspection, demonstration, testing, or the substitution of parts under instructions from the manufacturer, and then repackaged in the original container,
    - e) Any failure to make such inspections, adjustments, tests or servicing as the vendor has agreed to make or normally undertakes to make in the usual course of business, in connection with the distribution or sale of the products;
    - f) Demonstration, installation, servicing or repair operations, except such operations performed at the vendor's premises in connection with the sale of the product,
    - g) Products which, after distribution or sale by you, have been labeled or relabeled or used as a container, part or ingredient of any other thing or substance by or for the vendor.
  - 2) This insurance does not apply to any insured person or organization
    - a) From whom you have acquired such products, or any ingredient, part or container, entering into, ac-

companying or containing such products, or

- b) When liability included within the "products-completed operations hazard" has been excluded under this Coverage Part with respect to such products
- (d) Any state or political subdivision with which you have agreed per Paragraph 9.a.(1) above to provide insurance, subject to the following additional provision

This insurance applies only with respect to the following hazards for which the state or political subdivision has issued a permit in connection with premises you own, rent or control and to which this insurance applies

- 1) The existence, maintenance, repair, construction, erection, or removal of advertising signs, awnings, canopies, cellar entrances, coal holes, driveways, manholes, marquees, hoist away openings, sidewalk vaults, street banners, or decorations and similar exposures, or
  - 2) The construction, erection, or removal of elevators, or
  - 3) The ownership, maintenance, or use of any elevators covered by this insurance
- (e) Any state or political subdivision with which you have agreed per Paragraph 9.a.(1) above to provide insurance, subject to the following provisions:
    - 1) This insurance applies only with respect to operations performed by you or on your behalf for which the state or political subdivision has issued a permit

- 2) This insurance does not apply to "bodily injury", "property damage" or "personal and advertising injury" arising out of operations performed for the state or political subdivision.

- (f) Any person or organization with which you have agreed per Paragraph 9.a.(1) above to provide insurance, but only with respect to liability caused, in whole or in part, by your ongoing operations performed for that additional insured by you or on your behalf. A person or organization's status as an insured under this provision of this endorsement ends when your operations for that insured are completed.

- (3) Any insurance provided to an additional insured designated under Paragraph 9.a.(2)

- (a) Subparagraphs (e) and (f) does not apply to "bodily injury" or "property damage" included within the "products-completed operations hazard",

- (b) Subparagraphs (a), (b), (d) and (e) does not apply to "bodily injury", "property damage" or "personal and advertising injury" arising out of the sole negligence or willful misconduct of the additional insured or their agents, "employees" or any other representative of the additional insured, or

- (c) Subparagraph (f) does not apply to "bodily injury", "property damage" or "personal and advertising injury" arising out of

- 1) The rendering of or failure to render any professional services by you or on your behalf, but only with respect to either or both of the following operations

- a) Providing engineering, architectural or surveying services to others; and

- b) Providing or hiring independent professionals to provide engineering, architectural or surveying services in connection with the construction work you perform

Subject to the final paragraph of this exclusion below, professional services include

- a) Preparing, approving or failing to prepare or approve, maps, shop drawings, opinions, reports, surveys, field orders, change orders or drawings and specifications, and
- b) Supervisory or inspection activities performed as a part of any architectural or engineering activities

Professional services do not include services within construction means, methods, techniques, sequences and procedures employed by you in connection with construction work you perform

- 2) "Your work" for which a consolidated (wrap-up) insurance program has been provided by the prime contractor-project manager or owner of the construction project in which you are involved
- b. Only with regard to insurance provided to an additional insured designated under Paragraph 9.a.(2) Subparagraph (f) above, **SECTION III - LIMITS OF INSURANCE** is amended to include

The limits applicable to the additional insured are those specified in the written contract or agreement or in the Declarations of this Coverage Part, whichever are less. If no limits are specified in the written contract or agreement, or if there is no written contract or agreement, the limits ap-

plicable to the additional insured are those specified in the Declarations of this Coverage Part. The limits of insurance are inclusive of and not in addition to the limits of insurance shown in the Declarations.

- c. **SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS, 5. Other Insurance** is hereby amended as follows

Any insurance provided by this endorsement shall be primary to other insurance available to the additional insured except

- (1) As otherwise provided in **SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS, 5. Other Insurance, b. Excess Insurance**, or
- (2) For any other valid and collectible insurance available to the additional insured as an additional insured by attachment of an endorsement to another insurance policy that is written on an excess basis. In such case, the coverage provided under this endorsement shall also be excess.

#### 10. Broadened Contractual Liability - Work Within 50' of Railroad Property

It is hereby agreed that Paragraph f.(1) of Definition 12. "Insured contract" (**SECTION V - DEFINITIONS**) is deleted

#### 11. Property Damage to Borrowed Equipment

- a. The following is hereby added to Exclusion j. **Damage to Property of Paragraph 2., Exclusions of SECTION I - COVERAGES, COVERAGE A. BODILY INJURY AND PROPERTY DAMAGE LIABILITY**

Paragraphs (3) and (4) of this exclusion do not apply to tools or equipment loaned to you, provided they are not being used to perform operations at the time of loss

- b. With respect to the insurance provided by this section of the endorsement, the following additional provisions apply

- (1) The Limits of insurance shown in the Declarations are replaced by the limits designated in **Section B. Limits of Insurance, 11.** of this endorsement with respect to coverage provided by this endorsement. These limits are inclusive of and not in addition to the limits being replaced. The

Limits of Insurance shown in Section B. **Limits of Insurance**, 11. of this endorsement fix the most we will pay in any one "occurrence" regardless of the number of

- (a) Insureds,
- (b) Claims made or "suits" brought, or
- (c) Persons or organizations making claims or bring "suits"

**(2) Deductible Clause**

- (a) Our obligation to pay damages on your behalf applies only to the amount of damages for each "occurrence" which are in excess of the Deductible amount stated in Section B. **Limits of Insurance**, 11. of this endorsement. The limits of insurance will not be reduced by the application of such Deductible amount
- (b) Condition 2. **Duties in the Event of Occurrence, Offense, Claim or Suit**, applies to each claim or "suit" irrespective of the amount
- (c) We may pay any part or all of the deductible amount to effect settlement of any claim or "suit" and, upon notification of the action taken, you shall promptly reimburse us for such part of the deductible amount as has been paid by us.

**12. Employees as Insureds - Specified Health Care Services**

It is hereby agreed that Paragraph 2.a.(1)(d) of **SECTION II - WHO IS AN INSURED**, does not apply to your "employees" who provide professional health care services on your behalf as duly licensed.

- a. Nurses,
- b. Emergency Medical Technicians, or
- c. Paramedics,

in the jurisdiction where an "occurrence" or offense to which this insurance applies takes place

**13. Broadened Notice of Occurrence**

Paragraph a. of Condition 2. **Duties in the Event of Occurrence, Offense, Claim or Suit (SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS)** is hereby deleted and replaced by the following

- a. You must see to it that we are notified as soon as practicable of an "occurrence" or an offense which may result in a claim. To the extent possible, notice should include
  - (1) How, when and where the "occurrence" or offense took place,
  - (2) The names and addresses of any injured persons and witnesses, and
  - (3) The nature and location of any injury or damage arising out of the "occurrence" or offense

This requirement applies only when the "occurrence" or offense is known to an "authorized representative".

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

## ARIZONA AUTOMATIC ADDITIONAL INSURED - WHEN REQUIRED IN CONTRACT OR AGREEMENT WITH YOU - COMPLETED OPERATIONS

This endorsement modifies insurance provided under the following.

### COMMERCIAL GENERAL LIABILITY COVERAGE PART

**A. SECTION II - WHO IS AN INSURED, 2.** is amended to include

e. Any person or organization, hereinafter referred to as **Additional Insured**:

- (1) Who or which is not specifically named as an additional insured under any other provision of, or endorsement added to, this Coverage Part, and
- (2) For whom you are required to add as an additional insured, except any architect, engineer or surveyor, on a completed operations basis on this Coverage Part

under a written contract or written agreement

- (1) But only with respect to liability caused, in whole or in part, by "your work" performed for that additional insured by you or on your behalf, and
- (2) If the written contract or written agreement specifies coverage for the additional insured in the "products-completed operation hazard"

With respect to the person(s) or organization(s) referenced in Paragraph **A.2.e.** above, their status as an additional insured under this endorsement will not apply beyond the period of time required in that written construction contract or agreement referred to in Paragraph **A.2.e.** above. If that written construction contract or agreement does not specify a period of time, this coverage will not apply beyond 1 year from the completion of "your work" where the work that caused the "bodily injury" or "property damage" occurred. "Your work" will be deemed completed as specified in Paragraph **a.(2)** of **SECTION V - DEFINITIONS, 19.** "Products-completed operations hazard"

**B.** With respect to the additional insureds referenced in Paragraph **A.2.e.** above, the following exclusion is added to Paragraph **2. Ex-**

clusions of **SECTION I - COVERAGES, COVERAGE A. BODILY INJURY AND PROPERTY DAMAGE LIABILITY**, this insurance does not apply to "bodily injury" or "property damage" arising out of

- 1. The rendering of or failure to render any professional services by you or on your behalf, but only with respect to either or both of the following operations
  - a. Providing engineering, architectural or surveying services to others, and
  - b. Providing or hiring independent professionals to provide engineering, architectural or surveying services in connection with the construction work you perform

Subject to the final paragraph of this exclusion below, professional services include

- a. Preparing, approving or failing to prepare or approve, maps, shop drawings, opinions, reports, surveys, field orders, change orders, or drawings and specifications; and
- b. Supervisory or inspection activities performed as a part of any architectural or engineering activities

Professional services do not include services within construction means, methods, techniques, sequences and procedures employed by you in connection with construction work you perform

- 2. "Your work" for which a consolidated (wrap-up) insurance program has been provided by the prime contractor / project manager or owner of the construction project in which you are involved
- 3. "Bodily injury" or "property damage" arising out of "residential construction".

**C. SECTION III - LIMITS OF INSURANCE** is amended to include

The limits of insurance available to the additional insured(s) will not exceed

1. Those limits specified in the written construction contract or agreement referred to in Paragraph **A.2.e.** above, or
2. The Limits of Insurance specified in the Declarations of this Coverage Part,

whichever are less. If no limits are specified in that written construction contract or agreement, the limits available to the additional insured(s) will not exceed the Limits of Insurance specified in the Declarations of this Coverage Part. The limits of insurance available to the additional insured(s) are inclusive of and not in addition to the Limits of Insurance shown in the Declarations.

**D. SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS** is amended to include the following

**AUTOMATIC ADDITIONAL INSURED PROVISION**

The written construction contract or agreement referred to in Paragraph **A.2.e.** above must

1. Be currently in effect or become effective during the term of this Coverage Part, and
2. Have been executed prior to the "bodily injury" or "property damage" to which this endorsement pertains

**E. SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS, 5. Other Insurance, b. Excess Insurance** is amended to include the following

1. Where required by the written construction contract or agreement referred to in Paragraph **A.2.e.** above, this insurance is primary and / or noncontributory as respects any other insurance policy issued to the additional insured, and such other insurance policy shall be excess and / or

noncontributing, whichever applies, with this insurance.

2. Any insurance provided by this endorsement shall be primary to other insurance available to the additional insured except

- a. As otherwise provided in **SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS, 5. Other Insurance, b. Excess Insurance**, or

- b. When other valid and collectible insurance is available to the additional insured

- (1) As an additional insured by attachment of an endorsement to another insurance policy, and

- (2) On an excess basis

In such case the coverage provided under this endorsement shall also be excess

**F. SECTION V - DEFINITIONS** is amended to include

1. "Residential construction" means

- a. A structure where any of the structure's square foot area is used, or is intended, for the purpose of human habitation and includes, but is not limited to, single-family housing, multi-family housing, apartments, condominiums, townhouses, and similar structures intended for human habitation, and

- b. Common areas and appurtenant structures of those structures listed in Paragraph 1.a. above

"Residential construction" does not include

- a. Hospitals or prisons, and

- b. Military housing, dormitories, long-term care facilities, hotels or motels, provided there is no individual ownership of units

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**PRIMARY / NONCONTRIBUTORY AMENDMENT OF  
CONDITIONS FOR DESIGNATED ADDITIONAL  
INSUREDS**

This endorsement modifies insurance provided under the following

**COMMERCIAL GENERAL LIABILITY COVERAGE PART**

**SCHEDULE**

Name of Person or Organization (Additional Insured):

BLANKET IF REQUIRED BY WRITTEN CONTRACT, ORAL OR WRITTEN AGREEMENT

With respect to insurance provided the additional insured shown in the Schedule, **SECTION IV - COMMERCIAL GENERAL LIABILITY CONDITIONS, 5. Other Insurance** is deleted in its entirety and replaced by the following

**5. Other Insurance**

If other valid and collectible insurance is available to the additional insured for a loss we cover under Coverages **A** or **B** of this Coverage Part, our obligations are limited as follows

**a. Primary Insurance**

Where required by a written contract, this insurance is primary and noncontributory as respects any other insurance policy issued to the additional insured. Otherwise, **b.** below applies

**b. Excess Insurance**

This insurance is excess over any of the other insurance available to the additional insured whether primary, excess, contingent or on any other basis

When this insurance is excess, we will have no duty under Coverages **A** or **B** to defend any claim or "suit" that any other insurer has a duty to defend. If no other insurer defends, we will undertake to do so, but we will be entitled to the insured's rights against all those other insurers

When this insurance is excess over any other insurance, we will pay only our share of the amount of the loss, if any, that exceeds the sum of

- (1) The total amount that all such other insurance would pay for the loss in the absence of this insurance, and
- (2) The total of all deductible and self-insured amounts under all that other insurance.

We will share the remaining loss, if any, with any other insurance that was not bought specifically to apply in excess of the Limits of Insurance shown in the Declarations of this Coverage Part.

**c. Method of Sharing**

If all of the other insurance permits contribution by equal shares, we will follow this method also. Under this approach each insurer contributes equal amounts until it has paid its applicable limit of insurance or none of the loss remains, whichever comes first

If any of the other insurance does not permit contribution by equal shares, we will contribute by limits. Under this method, each insurer's share is based on the ratio of its applicable limit of insurance to the total applicable limits of insurance of all insurers

an "auto" you previously owned that had that coverage, and

- b. You tell us within 30 days after you acquire it that you want us to cover it for that coverage

**C. Certain Trailers, Mobile Equipment and Temporary Substitute Autos**

If Liability Coverage is provided by this Coverage Form, the following types of vehicles are also covered "autos" for Liability Coverage

- 1. "Trailers" with a load capacity of 2,000 pounds or less designed primarily for travel on public roads

- 2. "Mobile equipment" while being carried or towed by a covered "auto"
- 3. Any "auto" you do not own while used with the permission of its owner as a temporary substitute for a covered "auto" you own that is out of service because of its
  - a. Breakdown,
  - b. Repair,
  - c. Servicing,
  - d. "Loss", or
  - e. Destruction

**SECTION II - LIABILITY COVERAGE**

**A. Coverage**

We will pay all sums an "insured" legally must pay as damages because of "bodily injury" or "property damage" to which this insurance applies, caused by an "accident" and resulting from the ownership, maintenance or use of a covered "auto"

We will also pay all sums an "insured" legally must pay as a "covered pollution cost or expense" to which this insurance applies, caused by an "accident" and resulting from the ownership, maintenance or use of covered "autos" However, we will only pay for the "covered pollution cost or expense" if there is either "bodily injury" or "property damage" to which this insurance applies that is caused by the same "accident"

We have the right and duty to defend any "insured" against a "suit" asking for such damages or a "covered pollution cost or expense" However, we have no duty to defend any "insured" against a "suit" seeking damages for "bodily injury" or "property damage" or a "covered pollution cost or expense" to which this insurance does not apply We may investigate and settle any claim or "suit" as we consider appropriate Our duty to defend or settle ends when the Liability Coverage Limit of Insurance has been exhausted by payment of judgments or settlements

**1. Who is an Insured**

The following are "insureds"

- a. You for any covered "auto"
- b. Anyone else while using with your permission a covered "auto" you own, hire or borrow except
  - (1) The owner or anyone else from whom you hire or borrow a cov-

ered "auto" This exception does not apply if the covered "auto" is a "trailer" connected to a covered "auto" you own

- (2) Your "employee" if the covered "auto" is owned by that "employee" or a member of his or her household
- (3) Someone using a covered "auto" while he or she is working in a business of selling, servicing, repairing, parking or storing "autos" unless that business is yours
- (4) Anyone other than your "employees", partners (if you are a partnership), members (if you are a limited liability company), or a lessee or borrower or any of their "employees", while moving property to or from a covered "auto"
- (5) A partner (if you are a partnership), or a member (if you are a limited liability company), for a covered "auto" owned by him or her or a member of his or her household

- c. Anyone liable for the conduct of an "insured" described above but only to the extent of that liability

**2. Coverage Extensions**

**a. Supplementary Payments**

- We will pay for the "insured"
- (1) All expenses we incur
  - (2) Up to \$2,000 for the cost of bail bonds (including bonds for related traffic law violations) re-

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

## BLANKET WAIVER OF SUBROGATION - AUTO

This endorsement modifies insurance provided under the following

### BUSINESS AUTO COVERAGE FORM

This endorsement changes the policy effective on the inception date of the policy unless another date is indicated below

Endorsement Effective	04/07/12 - 04/07/13	Policy Number	EBA0133002
Named Insured			
Felix Construction Co , Inc			
Countersigned by			

(Authorized Representative)

With respect to coverage provided by this endorsement, the provisions of the Coverage Form apply unless modified by the endorsement

**1. Blanket Waiver of Subrogation**

**SECTION IV - BUSINESS AUTO CONDITIONS, A. Loss Conditions, 5. Transfer of Rights of Recovery Against Others to Us** is amended by the addition of the following

We waive any right of recovery we may have against any person or organization because

of payments we make for "bodily injury" or "property damage" arising out of the operation of a covered "auto" when you have assumed liability for such "bodily injury" or "property damage" under an "insured contract", provided the "bodily injury" or "property damage" occurs subsequent to the execution of the "insured contract"

CITY OF GLENDALE, ARIZONA  
PUBLIC WORKS/ENGINEERING DEPARTMENT

CONTRACTOR'S AFFIDAVIT  
REGARDING  
SETTLEMENT OF CLAIMS

**PROJECT 111226 - ARROWHEAD RANCH WATER RECLAMATION FACILITY  
EFFLUENT LINE FLOW METER REPLACEMENT**

To the City of Glendale, Arizona

Gentlemen:

This is to certify that all lawful claims for materials, rental of equipment and labor used in connection with the construction of the above project, whether by subcontractor or claimant in person, have been duly discharged.

The undersigned, for the consideration of \$ \_\_\_\_\_, as set out in the final pay estimate, as full and complete payment under the terms of the contract, hereby waives and relinquishes any and all further claims or right of lien under, in connection with, or as a result of the above described project. The undersigned further agrees to indemnify and save harmless the City of Glendale against any and all liens, claims of liens, suits, actions, damages, charges, costs, litigation expenses, attorneys' fees and any other and expenses whatsoever, which said City may suffer arising out of the failure of the undersigned to pay for all labor performance and materials furnished for the performance of said installation.

Signed and dated at \_\_\_\_\_, this \_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Contractor

By \_\_\_\_\_

STATE OF ARIZONA        )  
                                  ) ss.  
COUNTY OF MARICOPA    )

The foregoing instrument was subscribed and sworn to before me this \_\_\_ day of \_\_\_\_\_, 20

\_\_\_\_\_  
Notary Public

My Commission Expires: \_\_\_\_\_

SUPPLEMENTAL GENERAL CONDITIONS

1. **GENERAL:** By Ordinance No. 1110 New Series, the City of Glendale adopted the "Uniform Standard Specifications for Public Works Construction," which are sponsored and distributed by the Maricopa Association of Governments. Copies of these documents, with revisions, are on file in the office of the City Engineer of the City of Glendale, and are hereby made a part of these Contract Documents.

Whenever in the Uniform Standard Specifications, the words "The Contracting Agency" are used, the meaning shall be the City of Glendale.

In all cases where ASTM, AASHTO, AWWA, USAG, Federal, City of Phoenix, MAG Specifications, Maricopa County, Arizona State Highway, or other standard specifications are referred to, unless otherwise stated, revisions, supplements or addenda issued on or before the date of this contract, shall prevail. In the event of any conflict between these project specifications and the requirements of the plans, detail drawings, MAG Standard Details and Specifications, these project specifications shall prevail.

2. **DEFINITIONS:** The following terms, as used in or pertaining to the Contract Documents, are defined as follows:

**CITY:** The word "City" refers to the City of Glendale, Arizona. The official representative of said City in these proceedings shall be the City Engineer.

**CONTRACTOR:** The word "Contractor" means the person, firm, or corporation with whom the Contract is made by the City.

**MATERIALS:** The term "Materials" includes, in addition to materials incorporated in the project, equipment and other material used and/or consumed in the performance of the work.

**SUBCONTRACTOR:** The word "Subcontractor" includes those having a direct contract with the Contractor and those who furnish material worked to a special design according to the plans and/or specifications for this work, but does not include those who merely furnish materials not so worked.

**ENGINEER:** The word "Engineer" means a person, firm or corporation duly authorized by the City, to act for the City in staking out the work, inspecting materials and construction, and interpreting plans and specifications.

**CONTRACT DOCUMENTS:** The words "Contract Documents" mean the Notice to Contractors, Information for Bidders, "Uniform Standard Specifications for Public Works Construction," MAG General Conditions, Supplemental General Conditions, Special Provisions, Supplemental Specifications, Proposal, Contract, Certificates of Insurance, Plans and Addenda thereto.

3. **PROPOSAL QUANTITIES:** It is expressly understood and agreed by the parties hereto that the quantities of the various classes of work to be done and material to be furnished under this Contract, which have been estimated as stated in the Proposal, are only approximate and are to be used SOLELY for the purpose of comparing, on a consistent basis, the proposals offered for the work under this Contract; and the Contractor further agrees that the City will not be held responsible if any of the quantities shall be found incorrect; and the Contractor will not make any claim for damages or for loss of profits because of a difference between the quantities of the various classes of work as estimated and the work actually done. If any error, omission, or mis-statement is found to occur in the estimated quantities, the same shall not invalidate this Contract or release the Contractor from the execution and completion of the whole or any part of the work in accordance with the specifications and the plans herein mentioned, or for the prices herein agreed upon and fixed therefore, or excuse him from any of the obligations or liabilities hereunder, or entitle him to any damages or compensation except as may be provided for in this Contract.

4. **WITHDRAWAL OF PROPOSALS:** No proposal shall be withdrawn following the opening and reading of the bids for a period of 50 days from the date of opening without the consent of the

contracting agency through the body or agent duly authorized to accept or reject the proposal.

5. **LOSSES AND DAMAGES:** All loss or damage arising out of the nature of the work to be done or from the action of the elements, or from any unforeseen circumstances in the prosecution of the same, or from any unusual obstructions or difficulties which may be encountered in and/or during the prosecution of the work, or from any casualty whatsoever of every description, shall be sustained and borne by the Contractor at his own cost and expense except as otherwise provided by the contract documents or the laws of the State of Arizona.

6. **DUST PREVENTION:** The Contractor shall take whatever steps, procedures or means required to prevent abnormal dust conditions due to his construction operations in connection with this contract. The dust control measures shall be maintained at all times during construction of the project, to the satisfaction of the Engineer, in accordance with the requirements of the "Maricopa County Health Department Air Pollution Control Regulations" which have been adopted pursuant to A.R.S. § 36-779.

The Contractor shall be required to obtain the necessary permit from the Maricopa County Air Pollution Control Bureau, 1001 N. Central Ave., Phoenix, Arizona 85004 - telephone (602) 506-6727.

7. **EXCESS MATERIAL:** Excess material shall be removed from the work site and wasted at a location approved by the Engineer. Broken concrete and asphalt may be delivered to the Glendale Sanitary Landfill located at 115th Avenue and Glendale Avenue. The prevailing regulations and fee schedule will not be waived for work under this project. All materials, to be disposed of at the landfill, shall be weighed and disposed of at the prevailing rate.

8. **STOCKPILE OF MATERIALS:** The Contractor may place or stockpile materials in the public right-of-way, if approved by the Engineer, provided they do not prevent access to adjacent properties or prevent compliance with traffic regulations.

Traffic shall not be required to travel over stockpiled materials, and proper dust control shall be maintained.

9. **REFUSE COLLECTION ACCESS:** At any time the project construction shall require the closure or disruption of traffic in any roadway, alley, or refuse collection easement such that normal refuse collection will be interfered with, the Contractor shall, at least 48 hours prior to causing such closure or disruption, make arrangements with the Field Operations Department in order that refuse collection service can be maintained.

10. **CLEAN-UP:** After all work under this contract is completed, the Contractor shall remove all loose concrete, lumber, wire, reinforcing, debris, and other materials not incorporated in the work, from the site of the work. Clean-up shall include the removal of all excess pointing mortar materials within pipes and removal of over-size rocks and boulders left after finish grading. The contractor shall provide for the legal disposal of all waste products, debris, etc., and shall make necessary arrangements for such disposal.

11. **SHOP DRAWINGS:** The Contractor shall provide shop drawings as may be necessary for the prosecution of the work as required by the contract documents. The Engineer shall promptly review all shop drawings. The Engineer's approval of any shop drawing shall not release the Contractor from responsibility for deviations from the contract documents. The approval of any shop drawing which substantially deviates from the requirements of the contract documents shall be evidenced by a change order.

When submitted for the Engineer's review, shop drawings shall bear the contractor's certification that he has reviewed, checked, and approved the shop drawings and that they are in conformance with the requirements of the contract documents.

Portions of the work requiring a shop drawing or sample submission shall not begin until the shop drawing or sample submission has been approved by the Engineer. A copy of each approved shop drawing and each approved sample shall be kept in good order by the Contractor at the site and shall

12. PROTECTION OF FINISHED OR PARTIALLY FINISHED WORK: The Contractor shall properly guard and protect all finished or partially finished work, and shall be responsible for the same until the entire contract is completed and accepted, in writing, by the City. The Contractor shall turn over the entire work in full accordance with the specifications before final settlement shall be made.

13. STATUS OF EMPLOYEES: Contractor shall be responsible for assuring the legal working status of its employees and its subcontractor's employees.

14. LAWS AND REGULATIONS: This Contract shall be governed by and constructed in accordance with the laws of the State of Arizona. The Contractor shall keep himself fully informed of all existing and future City and County Ordinances and Regulations and State and Federal Laws and Occupational Safety and Health Standards (OSHA) in any manner affecting the work herein specified. He shall at all times observe and comply with said Ordinances, Regulations, or Laws.

15. PERMITS: The City has obtained certain required permits which are included in the project specifications, but it will be the duty of the Contractor to determine that all the necessary permits have been obtained. The Contractor shall, at his own expense, obtain all required permits which have not been furnished by the City. A no-fee permit will be issued for work in the City of Glendale right-of-way and easement. (Also see Paragraph 7. Dust Prevention.)

16. ELECTRIC POWER AND WATER: The Contractor shall make his own arrangements for electric power and water. Subject to the convenience of the City, he may be permitted to connect to existing facilities where available, but he shall meter and bear the cost of such power or water. Fire hydrant meters may be obtained from the City of Glendale. Installation and removal of meters should be scheduled at least forty-eight (48) hours in advance through the Public Works/Utilities Division at 930-2700. A \$325 deposit is required for each meter. The cost of the water is at the prevailing rate.

17. SURVEY CONTROL POINTS AND MONUMENTS: Existing survey monuments indicated on the plans or found during construction shall be protected by the Contractor, and in the event removal is necessary, removal and replacement shall be performed by permission of the Engineer, under direct supervision of the Engineer or his authorized representative. Survey monuments shall be constructed to conform to the requirements of MAG Specifications, Section 405, and Standard Details.

18. EXISTING UTILITIES: The Contractor is hereby advised that the location of all utilities, as shown on the plans, may not be complete nor exact and the Contractor shall satisfy himself as to the exact location of the utilities by contacting Blue Stake or the utility companies before proceeding with the work. After the underground utilities are located by Blue Stake or the utility company, the contractor shall excavate in a careful and prudent manner to prevent unwillful damage to the underground utilities.

In the event the Contractor or its Subcontractor damages an existing, properly identified underground City of Glendale water or sewer line, the Contractor shall be responsible for the repairs at its expense.

The exact location of all existing underground service utilities, whether or not indicated on the plans, shall be determined by the Contractor at no expense to the City, and he shall conduct his work so as to prevent interruption of service or damage to them.

The Contractor shall protect existing utility services and be responsible for their replacement if damaged by him, or to make necessary adjustment in their location, if required, in order to complete the work for his Contract.

Utility companies and other interested parties have been provided with construction plans and the construction schedule for this project. The Contractor shall comply with MAG Specifications 105.6 to cooperate with the utility companies.

19. MAINTENANCE OF IRRIGATION FACILITIES: Where irrigation facilities interfere with

construction, the Contractor shall remove and replace the affected irrigation facilities to its original condition. Final acceptance of replaced facilities will depend upon final approval of the Engineer.

20. **OVERHEAD UTILITY LINES AND POLES:** Contractor is advised that when work around overhead lines and poles is required on a project the Contractor is required to coordinate with Utility Companies who own and operate overhead lines and poles. The coordination may include, but not be limited to the following activities: pole bracing, de-energizing of lines, and temporary relocations. Contractor is responsible to contact the applicable Utility Company representative and discuss his proposed construction methods; in order to determine what actions the Utility Company must take and the costs related to those actions. The Contractor shall include these costs in the applicable bid items for this project.

The primary and the backup representatives for this review and cost determinations are as follows:

Arizona Public Service:	Mr. Bobby Garza	602-371-7989
Qwest:	Mr. Ron Floyd	602-630-1932
Salt River Power:	Mr. Al Baizel	602-236-0840
Cox Communications:	Mr. Randy Sims	623-694-9593
Cox Communications:	Ms. Suzanne Holzer	623-328-3522

21. **SOUTHWEST GAS FACILITIES EXPOSED DURING CONSTRUCTION:** The Contractor, upon exposing a gas line during construction, shall call SOUTHWEST GAS at 602-271-4277. The Southwest Gas patrolman will respond, usually within an hour, to inspect the line. Minor cuts or abrasions to the pipe coating will be rewrapped and tracer wire will be reconnected at no cost to the City.

22. **UNDERGROUND UTILITIES' BEDDING:** All water, sewer, storm drain, irrigation and other conduits installed within the City of Glendale shall be bedded from bottom of excavation to one foot above the pipe with granular bedding material meeting the requirements of Section 601.4.6 of MAG Uniform Standard Specifications. The initial bedding under the pipe is required for pipe having an inside diameter of 12 inches or larger, and in all cases where rock larger than 1-1/2" is encountered in the trench bottom.

23. **SEWER SERVICE LINES:** The Contractor shall be responsible for locating, and protecting from damage during construction, all sewer service lines within the project which are not owned by the City. Contractor will be permitted to review the "as-builts" to assist Contractor in locating the non-City owned sewer service lines. These "as-builts" were prepared, and supplied to the City, by private developers or contractors who installed the non-City owned sewer service lines. Therefore, the City does not guarantee or warranty the accuracy of such "as-builts" and the contractor, as a condition for being allowed to review such "as-builts", hereby agrees to hold the City harmless for any and all damages or other expenses contractor may incur as a result of any inaccuracies or incorrect information in these "as-builts".

24. **RIGHTS-OF-WAY:** The City will provide rights-of-way and easements for all work specified in this Contract, and the Contractor shall not enter or occupy with man, tools, equipment or materials any private ground outside the property of the City of Glendale, Maricopa County, Arizona, without the consent of the owner of such property.

25. **SUBCONTRACTS:** Subcontracts shall be in accordance with, and the Contractor shall be bound by, the following provisions:

All subcontracts shall be subject to the approval of the City.

All subcontracts shall be in writing and shall provide that all work to be performed thereunder shall be performed in accordance with the terms of the Contract.

Certified copies of any and all subcontracts shall be furnished to the City Engineering Department; however, prices may be omitted.

Subcontracts shall conform to the regulations governing employment of labor.

The subcontracting of any part of the work will in no way relieve the Contractor of his responsibility under the Contract.

26. **PRE-CONSTRUCTION CONFERENCE:** After completion of the Contract Documents, to include bonds, insurance and signatures, and prior to the commencement of any work on the project, the Engineer will schedule a Pre-Construction Conference. This will be held at the City of Glendale, 5850 West Glendale Avenue, Glendale, Arizona.

The purpose of this Conference is to establish a working relationship between the Contractor, Utility Companies, and the Engineer. The agenda will include critical elements of the construction schedule, procedures for handling shop drawings and other submittals, cost breakdown of major lump sum items, payment application and processing, coordination with the involved utility companies, emergency telephone numbers for all representatives involved in the course of construction, and establishment of the Notice to Proceed date.

Minimum attendance by the Contractor shall be a responsible official of the company/corporation, who is authorized to execute and sign documents on behalf of the company/corporation.

27. **OVERTIME:**

Regular Work Hours: The work required to be performed by the Plans and Specifications for the Project shall be performed only during regular working hours, unless the City has authorized overtime work in accordance with the procedures set forth below. Regular working hours shall be defined as one 8-1/2 hour shift per day, Monday through Friday, or, upon prior approval of the City, one 10-1/2 hour shift per day on a compressed four day work week during Monday through Friday. Regular working hours shall not include Saturdays, Sundays or City of Glendale recognized legal holidays.

Authorization and Costs: If the Contractor desires to schedule work for times other than regular work hours (overtime), the Contractor shall make a written request to the City at least two business days prior to the scheduled overtime. The City reserves the right to deny the request to work overtime based on the best interest and needs of the City. If an overtime request is denied, the City may, at its sole discretion, extend the contract time at no additional costs to the City.

In the event the Contractor does perform work overtime, with or without the prior approval of the City, the Contractor shall be responsible to the City for all additional costs that may be incurred by the City as a result of the Contractor's overtime work, including costs for engineering, inspections, testing, surveying and construction administration, all in accordance with MAG Section 108.5. However, the Contractor shall not be responsible for City's costs incurred as a result of overtime work requested by the City or overtime work resulting from an emergency which is not the responsibility of the Contractor or its employees, subcontractors or suppliers. The City's cost will be billed directly to the Contractor or may, at the City's option, be deducted from monies due the Contractor.

28. **CONTRACTOR'S CONSTRUCTION SCHEDULE:** Concurrently, with the execution of the contract and prior to the pre-construction conference, the Contractor shall submit a preliminary schedule for the Engineer's acceptance. The schedule shall be in sufficient detail to allow the Engineer to determine if the proposed schedule will conform to an approved program of construction operations, as determined by the contracting agency. Within ten calendar days after the preliminary schedule, described above, has been approved by the Engineer, the Contractor shall submit a progress schedule, utilizing the critical path method scheduling technique, showing the order in which he proposes to carry out the work, the dates on which he will start each phase of the work, and the contemplated date for completion of each phase. The Contractor shall not be permitted to commence construction until the schedule complying with this paragraph has been submitted to the City. The Contractor will not be granted any extension to the contract time or compensation for any damages as a result of the City's refusal to allow Contractor to commence construction until the critical path method progress schedule has been submitted and approved by the Engineer.

The critical path method (CPM) scheduling technique requires a breakdown of the entire work into

individual tasks and an analysis of the number of days required to perform each task. The schedule submitted to the City should highlight and identify the critical path for the project. After the work is in progress, the Contractor shall submit supplementary progress schedules, using the critical path method technique, of the progress to date and projection for completion. The supplementary progress schedules shall be submitted with each pay request in accordance with the paragraph, "Payments to Contractors," of these Supplemental General Conditions. The progress schedules shall be subject to the approval of the Engineer. In the event the Contractor fails to submit a supplementary progress schedule acceptable to the Engineer, the City may withhold further progress payments to the Contractor until the Contractor submits an acceptable supplementary progress schedule, which is approved by the Engineer, to the City. Schedule changes requiring an increase in the City's engineering personnel on the project shall not be put into effect until the Engineer has approved such increase and made arrangements for the required additional personnel.

29. CHARACTER OF WORKMEN: None but skilled foremen and workmen shall be employed on work requiring special qualifications. When required by the Engineer, the Contractor shall discharge any person who is, in the opinion of the Engineer, disorderly, dangerous, insubordinate, incompetent, or otherwise objectionable. The Contractor shall keep the City harmless from damages or claims for compensation that may occur in the enforcement of this section of the specifications.

30. HINDRANCES AND DELAYS: Except as otherwise provided herein, no charge shall be made by the Contractor for hindrances or delays from any cause during the progress of the work embraced in this Contract; but such delays, if due to no fault or neglect of the Contractor, shall entitle the Contractor to an extension of time allowed for completing the work, sufficient to compensate for the delay, the amount of the delay to be determined by the Engineer, provided the Contractor shall give said Engineer immediate notice in writing of the cause of such delay.

30.1 Delay: In the event of a delay for which the City is solely responsible, which is unreasonable under the circumstances and which was not within the contemplation of City and Contractor at the time this Contract is executed, City and Contractor shall negotiate, in good faith, a payment by the City to Contractor for the expenses incurred by Contractor as a result of such delay, in accordance with the City of Glendale Engineering Department's POLICY STATEMENT FOR CALCULATING DELAYS AND DAMAGES. This provision shall not be construed to void any provision in the contract which requires notice of delay or provides for liquidated damages. However, if the delay is the result of any act or neglect of a third party, including the architect, engineer or other contractor employed by the City, or by labor disputes, fire, unusual delay in transportation, adverse weather conditions not reasonably foreseeable, unavoidable casualties, or any causes beyond the Contractor's control, the Contractor shall not be entitled to any payments or compensation for expenses incurred as a result of such delay, but the Contract Time shall be extended by Change Order for such reasonable time as the Engineer may determine. No extension or compensation will be granted for any delay which is the result, wholly or partially, of any act or neglect of Contractor or any Subcontractor hired by Contractor.

31. LIQUIDATED DAMAGES:

31.1 Should the contractor fail to substantially complete the work under this contract within the time for completion stated in the paragraph "Time of Completion," in the Information for Bidders, then the contractor shall pay the City of Glendale, Arizona, liquidated damages, pursuant to the provisions of Section 108.9, Standard Specifications for Public Works Construction, Maricopa Association of Governments, until the work is substantially complete.

31.2 Should the contractor fail to fully and finally complete the work under this contract within the time for completion set forth in the paragraph "Time of Completion," in the Information for Bidders, even though the contractor has achieved substantial completion of the work within such time, then the contractor shall pay the City of Glendale, liquidated damages (pursuant to the provisions of Section 108.9, Standard Specifications for Public Works Construction, Maricopa Association of Governments), in an amount equal to 100% of the applicable liquidated damage rate set forth in MAG Section 108.9 for each and every calendar day of delay until the work is fully and finally complete and accepted.

31.3 The date of substantial completion shall be the date when the work is sufficiently complete, in

accordance with the contract documents, so the owner can fully occupy and utilize the work or designated portion thereof for the use for which it is intended, with all the project's parts and systems operable as required by the contract documents and all the work is complete, accessible, operable, and usable by the owner for its intended purpose(s), and all parts, systems and sitework are 100% complete and cleaned for the owner's use. Only incidental corrective work and final cleaning (if required), beyond cleaning needed for the owner's full use, may remain for final completion.

31.4 Full and final completion shall be that date when all work under the project, including incidental corrective work under punch list and final cleaning, has been completed and the entire project is accepted by the owner.

32. PAYMENTS TO CONTRACTOR: The measurements of quantities and the payments to the Contractor shall be in accordance with MAG Uniform Standard Specifications for Public Works Construction, Part 100 - General Conditions, Section 109 - Measurements and Payments.

Payments will be made on the basis of itemized, monthly statements prepared by the City and signed by the Contractor. The Contractor shall submit an itemized, duly certified and approved estimate for work completed through the last day of the preceding month in accordance with MAG Specifications, as amended by these Supplemental General Conditions. Upon approval of the pay estimate, the City will mail the check directly to the Contractor.

The pay estimate shall be accompanied by an updated progress schedule as required by these Supplemental General Conditions and a cash flow report when required by the Special Provisions. Approval of progress payments shall be conditional upon submittal of progress schedules and cash flow reports, when required, which are acceptable to the Engineer.

Upon 100% completion and acceptance of the project, and with the request for final payment, the Contractor shall complete and submit the "Contractor's Affidavit Regarding Settlement of Claims" form which is included in these specifications. Before final payment and release of retention, Contractor must arrange for its Surety to provide the City with a fully executed AIA Consent of Surety form. To avoid delays in the final payment, the Surety may send the Consent of Surety directly to the City via fax at (623) 915-2689, and mail the original to the City of Glendale Engineering Department, 5850 West Glendale Avenue, Glendale, Arizona 85301. Should any ambiguity arise between the Contract and these Conditions, the provisions of the Contract shall prevail.

\*\*\*END OF SUPPLEMENTAL GENERAL CONDITIONS\*\*\*

SPECIAL PROVISIONS

## 1. SCOPE OF WORK:

Currently, the effluent flow meter at the Arrowhead Ranch Water Reclamation Facility is not functioning properly. The purpose of this project is to remove the existing effluent flow meter and replace in kind.

## 2. DEFINITIONS:

A. Section: Reference to a Section on the plans or in these Specifications shall mean a Section of the Uniform Standard Specifications for Public Works Construction, sponsored and distributed by Maricopa Association of Governments (MAG), latest revision. The provisions of MAG Uniform Standard Specifications and Details for Public Works Construction, which are not altered or modified by the drawings or by these Special Provisions or by any subsequently issued Addendum, shall apply to the contract even though the Contractor's attention is not specifically drawn to such provisions.

B. Standard Detail: Reference to a MAG Standard Detail (MAG S.D.) on the plans or in these specifications shall mean a standard detail drawing in the latest revision of the Uniform Standard Specifications for Public Works Construction, sponsored and distributed by Maricopa Association of Governments. City of Glendale Standard Detail (C.O.G. S.D.) shall mean a standard detail drawing in the City of Glendale's Engineering Design and Construction Standards, latest revision. City of Phoenix Standard Detail (C.O.P. S.D.) shall mean a standard detail drawing in the Phoenix Supplemental Standard Details for Public Works Construction, latest revision.

3. **SUSPENSION OF WORK**: The Engineer reserves the right to suspend the work wholly or in part if deemed necessary for the best interest of the City. This suspension will be without compensation to the Contractor, other than to adjust the contract time in accordance with MAG Section 108.

4. **COMPLIANCE WITH MANUFACTURER'S INSTRUCTIONS**: In all instances wherein the item and/or specifications require installation or construction in accordance with either manufacturer's or supplier's recommendations and/or instructions, said recommendations and/or instructions shall be submitted with the applicable portions clearly marked for approval prior to the commencement of work on that item or portion of the contract.

5. **ENERGIZED AERIAL ELECTRICAL POWER LINES**: The utility company maintains energized aerial electrical power lines in the immediate vicinity of this project. Do not consider these lines to be insulated. Construction personnel working in proximity to these lines are exposed to an extreme hazard from electrical shock. Contractors, their employees, and all other construction personnel working on this project must be warned of the danger and instructed to take adequate protective measures, including maintaining a minimum ten (10) feet clearance between the lines and all construction equipment and personnel. (See: OSHA Standard 1926.550(a)15.) As an additional safety precaution, Contractors should also be instructed to call the utility company to arrange, if possible, to have these lines de-energized or relocated when the work reaches their immediate vicinity. The cost of such temporary arrangements would be borne by the Contractor. The utility company can often respond to such requests if two days advance notice is given, but some situations may require up to sixty (60) days lead time for relocation or other arrangements.

6. **CASH FLOW REPORT**: The Contractor shall prepare a Cash Flow Report for projected monthly project cash flow on a City provided form and submit it for approval prior to issuance of the Notice to Proceed. The accumulation of monthly pay estimate costs shall be plotted versus time in accordance with the proposed construction schedule. After approval, the Contractor shall submit an updated Cash Flow Report prior to the receipt of each Progress Payment. Each updated Cash Flow Report shall reflect the Contractor's actual monthly payment versus the actual elapsed contract time.

At the City's request, if the projected quarterly project cash flow varies by more than ten percent of the total contract price, the Contractor shall prepare a revised Cash Flow Report. Each revised Cash Flow Report is subject to approval by the City prior to issuance of the progress payment.

Revisions to the report resulting from Contractor initiated delays or work schedule changes shall be at no cost to the City. Any revisions required by City initiated delays or changes to the work shall be paid as an

integral part of the approved Change Order.

7. ALLOWANCE FOR CONSTRUCTION CONTINGENCIES: Bid schedule includes a lump sum contingency allowance. This allowance is at all times the property of the City and is for the sole purpose of reimbursing Contractor for any unforeseen work not apparent at the time of bidding or additional work requested by the CITY OF GLENDALE.

No work anticipated for reimbursement under this Bid Item shall be initiated by Contractor until Contractor, City of Glendale Representative and City of Glendale agree on the scope and cost to perform the additional work. The Contractor shall prepare and submit to City of Glendale Representative a cost itemization and summary for the additional work. City of Glendale Representative and City of Glendale shall review and approve prior to Contractor proceeding with any additional work. Any portion of the stated sum not expended remains the property of the City of Glendale.

Work under this section shall consist of any additional work identified by the owner and contractor due to construction activity. All work under this item shall be itemized as per MAG requirements and deducted from the set amount of \$2,500. All work under this section shall include but is not limited to all necessary materials, tools, layout, survey and labor required to complete each task.

Measurement and payment for this item shall be made on an individual basis per task and as described above. Limit for this item is set at \$2,500 on the bid form, under line item ALLOWANCE FOR CONSTRUCTION CONTINGENCY.

\*\*\*END OF SPECIAL PROVISIONS\*\*\*

**Arrowhead Ranch Wastewater Reclamation Facility (ARWRF)  
Effluent Flow Meter Replacement  
Project #111226**

**TECHNICAL SPECIFICATIONS**

**1. GENERAL DESCRIPTION OF WORK**

Contractor shall furnish and install one (1) new 16" flow meter to replace the existing flow meter on the effluent pipeline at the Arrowhead Ranch Wastewater Reclamation Facility (ARWRF) in accordance with the manufacturer's recommendations. Contractor will disconnect and reconnect electrical wiring associated with installation. Contractor will be responsible for dewatering the pipeline as necessary for the installation. See attached Exhibits 1 through 4 for location within the plant and piping system.

**2. SALVAGE OF MATERIALS AND EQUIPMENT**

Existing materials and equipment removed shall become Contractor's property.

**3. OPERATION OF EXISTING FACILITIES**

The existing treatment plant facilities must be kept in continuous operation throughout the construction period. No interruption will be permitted which adversely affects the degree of service provided. Provided permission is obtained for Owner in advance, portions of existing facilities may be taken out of service for short periods corresponding with periods of minimum service demands.

Any disruption in plant operations must be coordinated with Curt King, Senior Water Reclamation Facility Operator, at 623-930-3957.

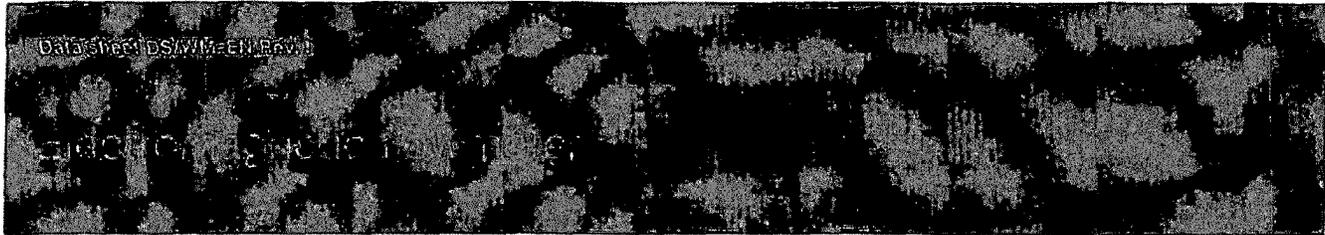
**4. FLOW METER SPECIFICATIONS**

Flow meter to be WaterMaster Electromagnetic flow meter or approved equal (see included data sheet).

**Must have**

- Remote mount transmitter
- 100' cable
- Fit into existing space of approximately 26 3/8 inches
- 4 to 20 mA outputs

See Item 21 in "Information for Bidders" on use of approved equals.



## The perfect fit for all water industry applications



### The most stable transmitter in the world

- self-calibrating transmitter and ultra-low temperature coefficient for highest accuracy

### One solution for all your needs

- designed for use in all water and waste water applications, from sewage plants to distribution networks

### Quick transmitter exchange

- revolutionary data storage enables transmitter interchange and commissioning without the need for reconfiguration

### Advanced infrared service port

- supports simultaneous and parallel operation of HART, remote HMI, cyclic data output and parameter dump

### Octagonal full-bore flow measurement sensor

- unique inner octagonal bore reduces sensitivity to flow profile disturbances

### OIML R49 Approved

- Type approved to OIML R49 to accuracy Class 1 and Class 2, for any pipe orientation and bidirectional flow
- Zero downstream pipe disturbance class, with T50 (0.1 to 50 °C [32.2 to 122 °F]) rating for guaranteed performance in any water application

### OIML R49 permanent self-checking

- Type P approved
- continuous self checking of the sensor and transmitter to ensure the highest accuracy and long term performance

### VeriMaster in situ verification software option

- allows the customer to perform in situ verification at the flowmeter

## **WaterMaster**

Electromagnetic flowmeter

### **The Company**

We are an established world force in the design and manufacture of instrumentation for industrial process control, flow measurement, gas and liquid analysis and environmental applications. As a part of ABB, a world leader in process automation technology, we offer customers application expertise, service and support worldwide. We are committed to teamwork, high quality manufacturing, advanced technology and unrivalled service and support. The quality, accuracy and performance of the Company's products result from over 100 years experience, combined with a continuous program of innovative design and development to incorporate the latest technology. Over ten flow calibration plants are operated by the Company, which is indicative of our dedication to quality and accuracy.

### **Introduction**

#### **Setting the standard**

The WaterMaster range, available in sizes 10 to 2200 mm (3/8 to 84 in), is designed specifically for use on the many diverse applications encountered in the Water and Waste-water industry.

The specification, features and user benefits offered by this range are based on ABB's worldwide experience in this industry and they are all targeted specifically to the industry's requirements.

#### **Flow performance**

WaterMaster has an operating flow range with  $\pm 0.4$  % accuracy as standard ( $\pm 0.2$  % optional) in both forward and reverse flow directions.

#### **Submersible and buriable**

All WaterMaster sensors have a rugged, robust construction to ensure a long, maintenance-free life under the arduous conditions experienced in the Water and Waste Industry. The sensors are, as standard, inherently submersible (IP68, NEMA 6P), thus ensuring suitability for installation in chambers and metering pits which are liable to flooding.

A unique feature of the WaterMaster sensors is that sizes DN40 to DN2200 are buriable; installation merely involves excavating to the underground pipe, fitting the sensor, cabling back to the transmitter and then backfilling the hole.

### **Comprehensive features**

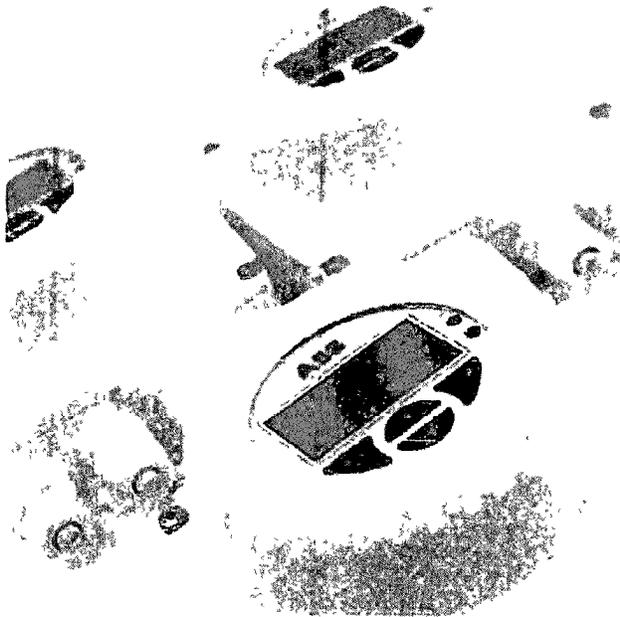
A wide range of features and user benefits are built into WaterMaster as standard:

- ☐ bi-directional flow
- ☐ unique, self-calibrating transmitter (patent approval in progress) for the ultimate in stability and repeatability
- ☐ OIML-type continuous self-checking, with alarms, ensures both sensor and transmitter accuracy
- ☐ true electrode and coil impedance measurement
- ☐ comprehensive simulation mode
- ☐ universal switch mode power supply (options are available for AC and DC supplies)
- ☐ comprehensive self-diagnostics compliant with NAMUR NE107
- ☐ programmable multiple alarm capability
- ☐ bus options: HART (4 to 20 mA), PROFIBUS (RS485)
- ☐ 3 configurable pulse/frequency and alarm outputs
- ☐ advanced infrared service port supports remote HMI, HART, cyclic data out and parameter dump
- ☐ VeriMaster In situ verification software available as option
- ☐ Read-only switch and ultra-secure service password for total security

**WaterMaster**  
Electromagnetic flowmeter

**Assured quality**

WaterMaster is designed and manufactured in accordance with international quality procedures (ISO 9001) and all flowmeters are calibrated on nationally-traceable calibration rigs to provide the end-user with complete assurance of both quality and performance of the meter.



**WaterMaster – electromagnetic flowmeter**

**The perfect fit for all water industry applications**

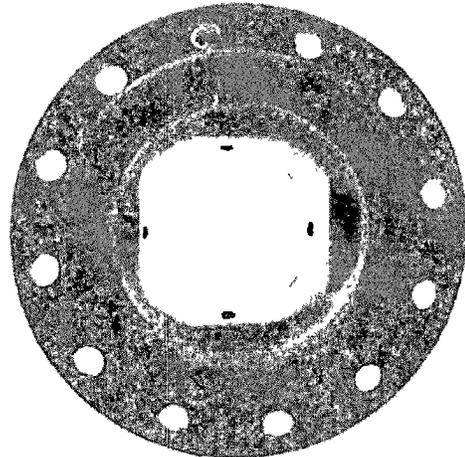
Unrivalled in its scope and applications expertise, ABB offers the world's most comprehensive range of flow measurement products. The FlowMaster family of products is unsurpassed in the number of proven measurement techniques, variety of models and scope of application and includes the WaterMaster range of Electromagnetic Flowmeters.

Getting the best levels of efficiency and performance from your production process requires reliable, accurate instrumentation. WaterMaster provides the flexibility to solve your most demanding water applications enabling previously unattainable operational and financial benefits. WaterMaster is the ultimate solution for flow measurement and management in sectors as diverse as water, wastewater, sewage and effluent.

WaterMaster delivers speed, simplicity and ease of use at every stage of the product's lifecycle. In fact, WaterMaster doesn't just plug the gaps left by competitive products, it is simply the best flow metering solution available today.

**Superior control through advanced sensor design**

Innovative, patented octagonal sensor design improves flow profile and reduces up- and down-stream piping requirements for the most commonly used sizes of 40 to 200 mm (1½ to 8 in).



*Octagonal bore*

Using a unique, controlled derivative excitation combined with advanced filtering, WaterMaster improves accuracy by raising zero stability to new levels, resulting in higher accuracy measurements.

Proven in the toughest applications, WaterMaster's rugged, robust and buriable sensors eliminate the need for expensive meter chambers thus providing a long, productive and maintenance-free asset life.

**WaterMaster**  
Electromagnetic flowmeter

**Powerful and flexible transmitter**

The backlit, graphical display is rotated easily up to 180 ° (90 ° each way) without any tools, enabling users to position it as best fits their needs. 'Through-the-glass' control allows local operator interface to enable short, quick data entry for all user-specific parameters.



*Transmitter display*

ABB's universal Human Machine Interface (HMI) simplifies operation, maintenance and training; thereby reducing cost of ownership and providing one common user experience.

All WaterMaster versions utilize an electronics cartridge to simplify installation and reduce the number of spare parts. Two variants of the cartridge are available, a standard HART protocol variant and a PROFIBUS variant – both variants enable online modification and monitoring of parameters.

The same cartridge type (HART or PROFIBUS) is used in both integral and remote installations. The HART cartridge features active current and passive pulse outputs while the PROFIBUS cartridge features passive pulse outputs.

**Intuitive navigation and configuration**

The user-friendly interface allows fast and simple data entry for all parameters. 'Easy Setup' guides the operator step-by-step through the menu to set parameters as quickly as possible, thereby simplifying the commissioning phase.

**Improved performance through Digital Signal Processing (DSP)**

Advanced Digital Signal Processing (DSP) gives improved performance and enables real time measurements for maximum reliability.

DSP enables the transmitter to separate the real signal from the noise, therefore providing high quality outputs especially in harsh environments involving vibration, hydraulic noise and temperature fluctuation.

**WaterMaster**  
Electromagnetic flowmeter

**Self-calibration**

A unique self-calibration concept developed by ABB (patent pending) has been implemented in WaterMaster. Compliance with OIML R49 Type P (Permanent) checking requirements requires that electromagnetic flowmeters have 'Checking Facilities', where a simulated signal is fed into the input of the flow transmitter and the output is compared and checked within predetermined limits.

WaterMaster has taken this to the next level and uses this signal to not only check the accuracy, but also to perform automatic calibration. This not only meets and exceeds the OIML R49 requirements, it also means the instrument has the following features:

- ❶ self-calibrating instrument
- ❷ factory calibration no longer necessary
- ❸ calibration adjustment is continuous during normal running
- ❹ ultra-stable performance with time
- ❺ very low temperature coefficient
- ❻ the measurement accuracy depends on one precision resistor only
- ❼ adjustment % displayed to user for diagnostic use
- ❽ alarm limits to trap hardware failures and out-of-range adjustments

**Speed, ease and security in the field**

'Fit-and-Flow' data storage inside WaterMaster eliminates the need to match sensor and transmitter in the field. On initial installation, the self-configuration sequence automatically replicates into the transmitter all calibration factors, meter size and serial numbers, as well as customer site-specific settings, eliminating the opportunity for error.

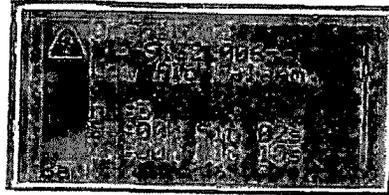
This redundant storage of data in both the sensor and transmitter memory is continually updated during all operations to ensure the integrity of the measurement.

An automatic data self-repair routine corrects any data corruption such as totalizer volume corruption that could occur during a power failure.

**Detailed diagnostics for rapid decision making**

WaterMaster is proven to be robust and reliable, with unmatched diagnostic capabilities providing the correct information to keep your process up and running. In accordance with NAMUR NE107, alarms and warnings are classified with the status of 'maintenance required', 'check function', 'failure' and 'out of specification'.

The following screen shows an alarm history with the number of occurrences for the alarm together with time durations.



*Diagnostics display*

**Advanced infrared service port**

WaterMaster as standard incorporates an infrared service port that enables the meter's configuration to be saved externally.

If a customer alters the configuration and causes the instrument to behave erratically, the infrared service port enables ABB technicians to assist in troubleshooting the problem by allowing easy, remote access to the configuration data.

The infrared service port is used to interrogate HMI menu items automatically and dump the HMI parameter settings and cyclic output measured values (such as flowrate and diagnostic measurement) through the service port to a terminal program. Data can then be downloaded to a PC, saved to a terminal application and output as text or spreadsheet data.



*Transmitter with infrared communications device attached*

## **WaterMaster**

Electromagnetic flowmeter

### **Attention to the smallest technical detail delivers big operational benefits**

ABB's WaterMaster sets the standard for flow measurement and management applications in the water, sewage and effluent industries.

Leveraging advanced technology, WaterMaster delivers the power to solve your most demanding applications, enabling previously unattainable operational and financial benefits.

### **The perfect balance of power, performance, flexibility and control**

With WaterMaster, flexible doesn't mean complicated. Take advantage of its innovative and versatile attributes to achieve interoperability within a wide range of asset management systems. WaterMaster, the best solution for your flow measurement needs.

*Now the best in class is even better!*

### **In situ verification**

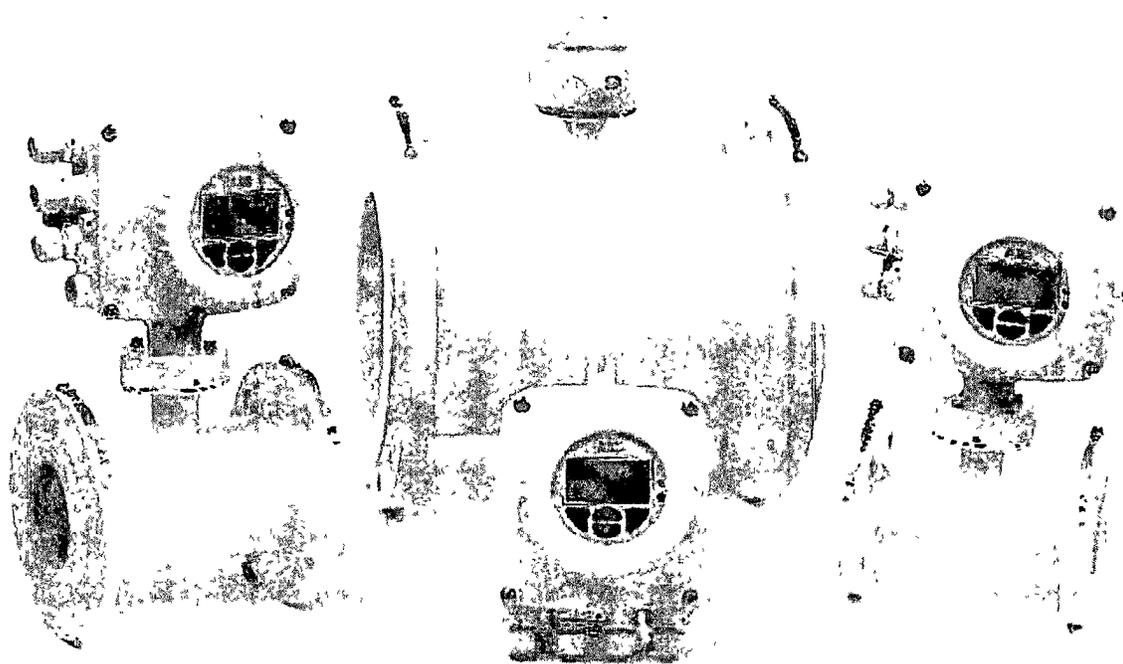
WaterMaster is now extended to include VeriMaster for in situ verification. VeriMaster is a PC application, that when coupled to the WaterMaster through the infrared service port, generates a report on the accuracy of the complete flowmeter, both sensor and transmitter. It builds on over 10 years of ABB's experience in the verification field, through its leading CalMaster range. VeriMaster is a quick and easy to use utility, that uses the advanced self-calibration and diagnostic capability of WaterMaster, coupled with fingerprinting technology, to determine the accuracy status of the WaterMaster flowmeter to within +/-1 % of its original factory calibration. VeriMaster also supports printing of calibration verification records for regulatory compliance.

VeriMaster integrates with WaterMaster seamlessly, meaning:

- no interruption to any of the wiring
- no cover removal, with operation through the front glass using the infrared service port
- no interruption to the measurement

If desired, an operator can additionally check and record the accuracy of the current and pulse outputs. VeriMaster is compatible with Microsoft Windows 7, Windows XP and Vista operating systems

**WaterMaster**  
Electromagnetic flowmeter



*The WaterMaster family*

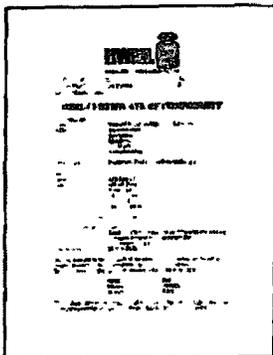
**WaterMaster**  
Electromagnetic flowmeter

**OIML / MID approved**

WaterMaster has been type tested and Internationally approved through UK National Weights and Measures Laboratory, to the highest accuracy class 1 and 2 for cold and hot potable water meters, known as OIML R49-1 (Organisation Internationale de Métrologie Légale). For full details, OIML R49 is available to download from [www.oiml.org](http://www.oiml.org). Its requirements are very similar to other international standards, such as the latest revisions of EN14154 and ISO4064. WaterMaster accuracy is better than OIML R49-1 or any of these international standards, with a tighter accuracy specification at the higher flow rates, improving over OIML Class 1 of  $\pm 1\%$  to  $\pm 0.2\%$  above  $Q_{0.2}$  %, also from Class 2 of  $\pm 2\%$  to  $\pm 0.4\%$  above  $Q_{0.4}$  %. At lower flowrates, typical WaterMaster accuracies follow the 'trumpet' accuracy curve defined by typically  $\pm 0.9$  mm / s, again tighter than the OIML accuracy limits.

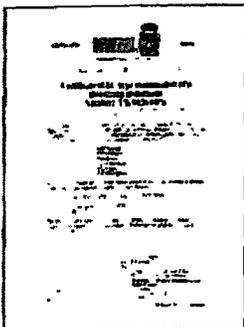
The OIML R49-1 certificate of conformity is available from:

<http://www.abb.com/product/seitp330/b42ec2377d3293cd c12573de003db93b.aspx>



WaterMaster is also approved under the EU Measuring Instruments Directive (MID) 2004/22/EC, that covers putting into use water meters for certain applications. MID WaterMaster is secured against tampering and is available as an option, along with fingerprinting for ABB VeriMaster in situ Verification product, with certificate printout to  $\pm 1\%$  accuracy. WaterMaster certificates of EC type-examination of a measuring instrument are available from:

<http://www.abb.com/product/seitp330/b42ec2377d3293cd c12573de003db93b.aspx>



WaterMaster has been assessed by type approval at the National Measurement Office (NMO) to OIML R49 and passed to the very highest accuracy designations for sizes DN40 to DN200.

The approval is for:

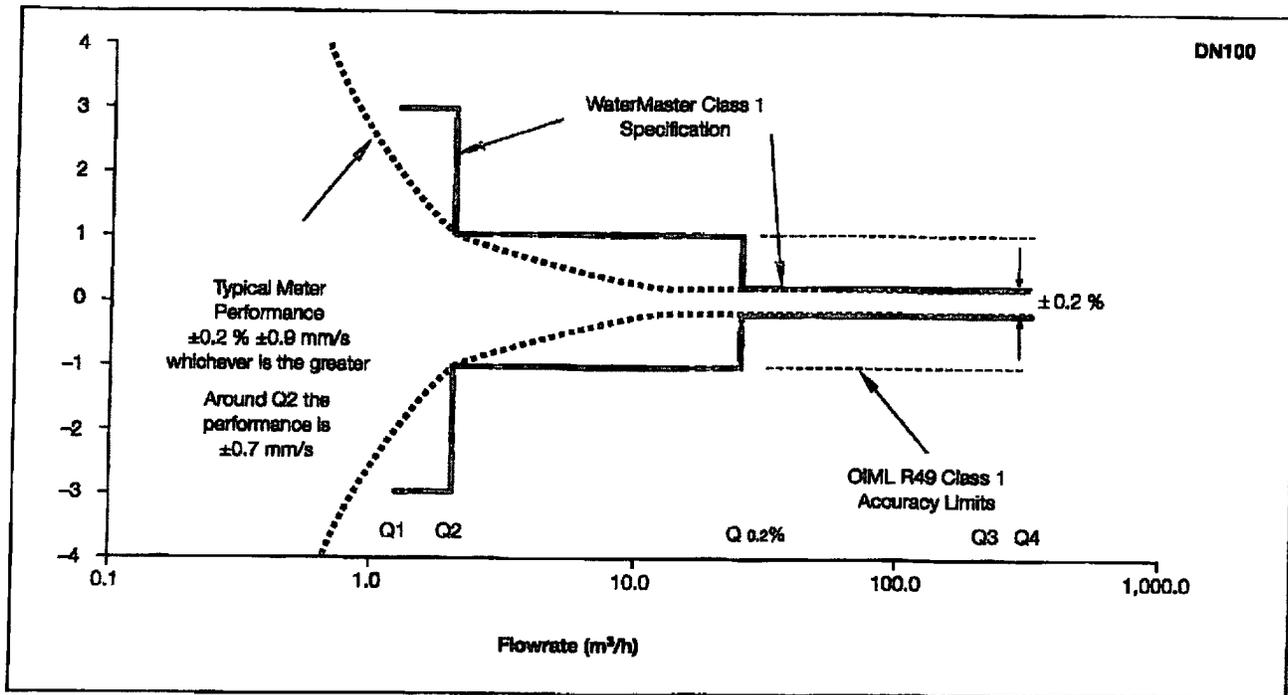
- Class 1 and Class 2 accuracy (calibration option)
- Environmental class T50 for water temperatures of 0.1 °C to 50 °C
- Electromagnetic Environment E2 (10V/m)
- Any pipe orientation
- 5 Diameters upstream pipe
- 0 Diameters downstream pipe
- Pressure Loss Class <0.25 bar
- Integral or remote transmitter (<200 m cable)
- DN40 – DN200, bi-directional flow

A major advance in WaterMaster is the self-checking capabilities which meet and exceed the R49 requirements and is first electromagnetic flowmeter to be approved to OIML Type P permanent self checking during normal operation (not just at startup) and alarm indication for:

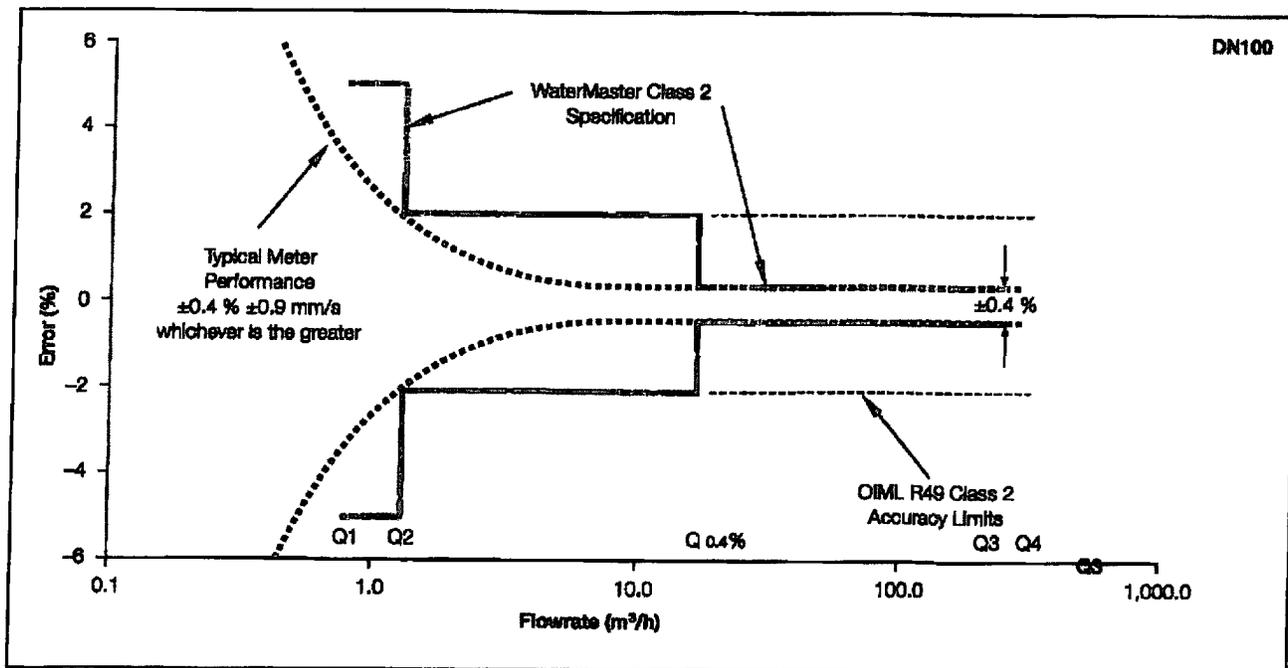
- transmitter and sensor status, with an accuracy alarm
- program ROM and RAM status
- double, independent storage of totalizer values, in both the sensor and transmitter non-volatile memories
- display test

**WaterMaster**  
Electromagnetic flowmeter

**WaterMaster specification to OIML R49 Class 1**



**WaterMaster specification to OIML R49 Class 2**



Although OIML R49 does not define the flow accuracy below Q1, WaterMaster continues to measure flow at lower flow rates down to a cutoff velocity of ±5 mm/s (±0.2 in/s). The accuracy between cutoff and Q1 is typically ±0.9 mm/s (±0.04 in/s).

**WaterMaster**  
Electromagnetic flowmeter

**WaterMaster flow performance – m<sup>3</sup>/h**

DN	Q4 (m <sup>3</sup> /h)	Q3 (m <sup>3</sup> /h)	Standard Calibration 0.4 % OIML R49 Class 2			High Accuracy Calibration 0.2 % OIML R49 Class 1		
			Qmax (m <sup>3</sup> /h)	Q2 (m <sup>3</sup> /h)	Q1 (m <sup>3</sup> /h)	Qmax (m <sup>3</sup> /h)	Q2 (m <sup>3</sup> /h)	Q1 (m <sup>3</sup> /h)
10	3.1	2.5	0.167	0.013	0.008	0.31	0.02	0.012
15	7.88	6.3	0.42	0.032	0.02	0.79	0.05	0.03
20	12.5	10	0.87	0.05	0.032	1.25	0.08	0.05
25	20	16	1.1	0.08	0.05	2	0.13	0.08
32	31.25	25	1.67	0.13	0.08	3	0.20	0.13
40**	50	40	4.2	0.2	0.13	6	0.32	0.2
50**	79	63	4.2	0.32	0.20	7.9	0.5	0.32
65*	125	100	6.7	0.5	0.32	12.5	0.8	0.5
80**	200	160	10.7	0.81	0.51	16	1.3	0.8
100**	313	250	16.7	1.3	0.79	25	2	1.25
125	313	250	16.7	1.3	0.79	25	2	1.25
150**	788	630	42	3.2	2.0	63	5	3.2
200**	1,250	1,000	67	5.1	3.2	100	8	5
250	2,000	1,600	107	8.1	5.1	160	13	8
300	3,125	2,500	167	12.7	7.9	250	20	12.5
350	5,000	4,000	267	20.3	12.7	400	32	20
400	5,000	4,000	267	20.3	12.7	400	32	20
450	7,875	6,300	420	32	20	630	50	32
500	7,875	6,300	420	32	20	630	50	32
600	12,500	10,000	667	51	32	1000	80	50
700	20,000	16,000	1600	102	64	1600	160	100
30 in	20,000	16,000	1600	102	64	1600	160	100
800	20,000	16,000	1600	102	64	1600	160	100
900	31,250	25,000	2500	160	100	2500	250	156
1000	31,250	25,000	2500	160	100	2500	250	156
42 in	31,250	25,000	2500	160	100	2500	250	156
1200	50,000	40,000	4000	256	160	4000	400	250
1400	78,750	63,000	6300	403	252	6300	630	394
60 in	78,750	63,000	6300	403	252	6300	630	394
1600	78,750	63,000	6300	403	252	6300	630	394
1800	125,000	100,000	10000	640	400	10000	1000	625
2000	125,000	100,000	10000	640	400	10000	1000	625
2200	200,000	160,000	16000	1024	640	16000	1600	1000

\*Future option

\*\* OIML R49 Certificate of Conformance to Class 1 and Class 2.

**Note.** OIML R49-1 allow Class 1 only for meters with Q<sub>3</sub> ≥ 100 m<sup>3</sup>/h. Meters outside this range have been tested and conform to Class 1

WaterMaster  
Electromagnetic flowmeter

WaterMaster flow performance – gal/min

NPS/NB (DN)	Q4 (gal/min)	Q3 (gal/min)	Standard Calibration 0.4 % OIML R49 Class 2			High Accuracy Calibration 0.2 % OIML R49 Class 1		
			Q4.5 (gal/min)	Q2 (gal/min)	Q1 (gal/min)	Q4.5 (gal/min)	Q2 (gal/min)	Q1 (gal/min)
3/8 (10)	13.8	11	0.73	0.06	0.035	1.38	0.09	0.053
1/2 (15)	34.7	27.7	1.85	0.14	0.09	3.48	0.22	0.14
3/4 (20)	55	44	2.94	0.22	0.14	5.5	0.35	0.22
1 (25)	88	70.4	4.7	0.35	0.22	8.8	0.57	0.35
1 1/4 (32)	137.6	110	7.3	0.57	0.35	13.2	0.88	0.57
1 1/2 (40)	220	176	18.5	0.89	0.56	26.4	1.41	0.88
2 (50)	347	277	18.6	1.41	0.88	34.7	2.22	1.39
2 1/2 (65*)	550	440	29.4	2.24	1.40	55.0	3.52	2.20
3 (80)	881	704	47.0	3.58	2.24	70.4	5.64	3.52
4 (100)	1,376	1,101	73.4	5.59	3.49	110	8.81	5.50
5* (125*)	1,376	1,101	73.4	5.59	3.49	110	8.81	5.50
6 (150)	3,467	2,774	185	14.1	8.81	277	22.2	13.9
8 (200)	5,604	4,403	294	22.4	14.0	440	35.2	22.0
10 (250)	8,806	7,045	470	35.8	22.4	704	56.4	35.2
12 (300)	13,759	11,007	734	56.9	34.9	1,101	88.1	55.0
14 (350)	22,014	17,611	1,174	89.5	55.9	1,761	141	88.1
16 (400)	22,014	17,611	1,174	89.5	55.9	1,761	141	88.1
18 (450)	34,673	27,738	1,849	141	88.1	2,774	222	139
20 (500)	34,673	27,738	1,849	141	88.1	2,774	222	139
24 (600)	55,036	44,029	2,935	224	140	4,403	352	220
27/28** (700)	88,057	70,446	7,045	451	282	7,045	704	440
30 (760)	88,057	70,446	7,045	451	282	7,045	704	440
32 (800)	88,057	70,446	7,045	451	282	7,045	704	440
36 (900)	137,590	110,072	11,007	704	440	11,007	1,100	688
39/40** (1000)	137,590	110,072	11,007	704	440	11,007	1,100	688
42 (1050)	137,590	110,072	11,007	704	440	11,007	1,100	688
48 (1200)	220,143	176,115	17,611	1,127	704	17,611	1,761	1,101
54 (1400)	346,726	277,381	27,738	1,775	1,110	27,738	2,773	1,733
60 (1500)	346,726	277,381	27,738	1,775	1,110	27,738	2,773	1,733
66 (1600)	346,726	277,381	27,738	1,775	1,110	27,738	2,773	1,733
72 (1800)	550,358	440,287	44,029	2,818	1,761	44,029	4,403	2,752
78 (2000)	550,358	440,287	44,029	2,818	1,761	44,029	4,403	2,752
84 (2200)	880,573	704,459	70,446	4,509	2,818	70,446	7,045	4,403

\*Future option

\*\*Size is dependent on flange specification

**WaterMaster**  
Electromagnetic flowmeter

## Specification – sensor

### Functional specification

#### Pressure limitations

As per flange rating – non approved  
PN16 for OIML R49 Approved

#### Temperature limitations

Ambient temperature  
Remote transmitter –20 to 70 °C (-4 to 158 °F)  
Integral transmitter –20 to 60 °C (-4 to 140 °F)  
Process temperature –6 to 70 °C (21 to 158 °F) – non approved  
0.1 to 50 °C (32.2 to 122 °F) – OIML R49 T50  
Approved

#### Environmental protection

##### Rating:

IP68 (NEMA 6) to 10m (33 ft) depth with fully-potted terminal box – not DN10 to DN32

IP67 (NEMA 4X) – DN10 to DN32

##### Buriable (sensor only)

FEWNo

FEV and FEFYes

##### Conductivity

>5µS cm<sup>-1</sup>

##### Transmitter mounting

Integral or remote

##### Electrical connections

20 mm glands

1/2 in NPT

20 mm armored glands

##### Sensor cable

ABB WaterMaster cable available in two forms – standard and armored

Maximum length 200 m (660 ft)

## Physical specification

### Wetted parts

#### Lining material

PTFE	(sizes DN10 to DN32 [3/8 to 1 1/4 NB])
Polypropylene	(sizes DN40 to 200 [1 1/2 to 8 NB])
Elastomer	(sizes DN250 to 2200 [10 to 84 NB])
WRAS listed – NSF61 approved	(sizes DN40 to 200 [1 1/2 to 8 NB])
NSF	(FEW DN350 to 600) (FEW DN350 to 600) (FEV40 to 200 and FEF250 to 2200)

#### Electrode material

Stainless steel 316 L

Hastelloy® C-22 (Hastelloy C4 on DN10 to DN32)

(Other electrode materials available on request)

#### Potential equalizing rings

Optional (recommended)

#### Lining protection plates

Not required

#### Installation conditions (recommended)

Upstream ≥ 5D

Downstream ≥ 0D

#### Pressure loss

<0.25 bar at G3 (sizes DN40 to 200 [1 1/2 to 8 NB])

Negligible at G3 (sizes DN10 to 32 [3/8 to 1 1/4 NB], DN250 to 2200 [10 to 84 NB])

### Non-wetted parts

#### Flange material

Carbon steel (sizes DN20 to DN2200 [3/4 to 84 NB])

Stainless steel (sizes DN10 to DN15 [3/8 to 1/2 NB])

#### Housing material

Carbon steel (sizes DN40 to 200 [1 1/2 to 8 NB] and DN700 to 2200 [28 to 84 NB])

Plastic (sizes DN250 to 600 [10 to 24 NB])

Aluminium (FEW, sizes DN10 to DN32 [3/8 to 1 1/4 NB])  
(FEW, sizes DN350 to DN400 [14 to 16 NB])

Carbon steel (FEW, sizes DN450 to DN600 [18 to 24 NB])

#### Terminal box material

Polycarbonate

#### Cable gland material

Plastic or brass

**WaterMaster**  
Electromagnetic flowmeter

**Specification – transmitter**

**Functional specification**

**Power supply**

Mains	85 to 265 V AC @ <7 VA
Low voltage	24 V AC +10 %/-30 % @ <7 VA
DC	24 V ±30 % @ <0.4 A

Supply voltage fluctuations within the specified range have no effect on accuracy

**Digital Outputs (3 off)**

- Rating 30 V @ 220 mA, open collector, galvanically isolated
- Maximum output frequency 5250 Hz
- 1 off dedicated to Alarm / Logic, programmable function
- 2 off configurable to either Pulse / Frequency or Alarm/Logic function

**Current output – HART FEX100 variant**

- 4 to 20 mA or 4 to 12/20 mA, galvanically isolated
- Maximum loop resistance 750 Ω
- HART protocol Version 5.7 (HART registered)
- Signal levels compliant with NAMUR NE 43 (3.8 to 20.5 mA)
- Low alarm 3.8 mA, High alarm 21.8 mA
- Additional accuracy**
  - ±0.1 % of reading
  - Temperature coefficient: typically <±20 ppm/°C

**RS485 Communications – PROFIBUS FEX100-DP variant**

- Registered name: FEX100-DP
- RS485 (9.6kbps to 1.5Mbps), galvanically isolated
- DPV0, DPV1
- PA Profile 3.01
- Standard Idents: 9700, 9740, 9741
- FEX100-DP specific ident: 3431
- 3 Concurrent MS2 master connections

**Electrical connections**

- 20 mm glands ½ in NPT, 20 mm armored glands

**Temperature limitations**

- Ambient temperature -20 to 60 °C (-4 to 140 °F)
- Temperature coefficient Typically <±10 ppm/°C @ Vel ≥0.5 m/s

**Environmental protection**

- Humidity: 0 to 100 %
- Rating: IP67 (NEMA 4X) to 1m (3.3 ft) depth

**Tamper-proof security**

- Write access prevented by internal switch combined with external security seals for MID applications

**Languages**

- English, French, German, Italian, Spanish, Polish

**Infrared service port**

- USB adapter (accessory), USB 1.1. and 2.0 compatible
- Driver software for Windows 2000, XP, 7 and Vista

**Housing material**

- Powder-coated aluminium with glass window

**Hazardous approvals (HART variant only)**

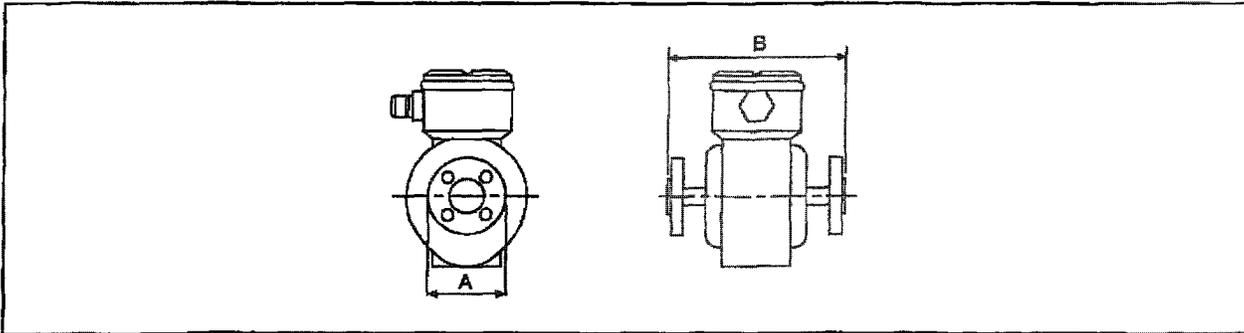
- FM & FMC Class 1 Div 2
  - (FM listing NI / 1 / 2 / ABCD / T4, S / II, III / 2 / FG / T4, Ta=60C; Type 4X, IP67 - for transmitter and integral mounting
  - Ta=70C, Type 6P, IP68 - for remote sensor type)
  - (FMC listing NI / 1 / 2 / ABCD / T4, DIP / II, III / 2 / FG / T4, Ta=60C; Type 4X, IP67 - for transmitter and integral mounting
  - Ta=70C, Type 6P, IP68 - for remote sensor type)
- FET, FEV, FEW and FEF DN700 to 2200 (27/28" to 84) only
- \*Size is dependent on flange specification

**Declaration of Conformance**

- Copies of CE and PED certification will be available on request.
- WaterMaster has OIMLR49 Certificate of Conformity to accuracy class 1 and 2. Copies of accuracy certification are available on request.
- WaterMaster has been type examined under directive MID 2004/22/EC, Annex MI-001. Copies of this certificate are available on request.

**WaterMaster**  
Electromagnetic flowmeter

**Sensor dimensions**

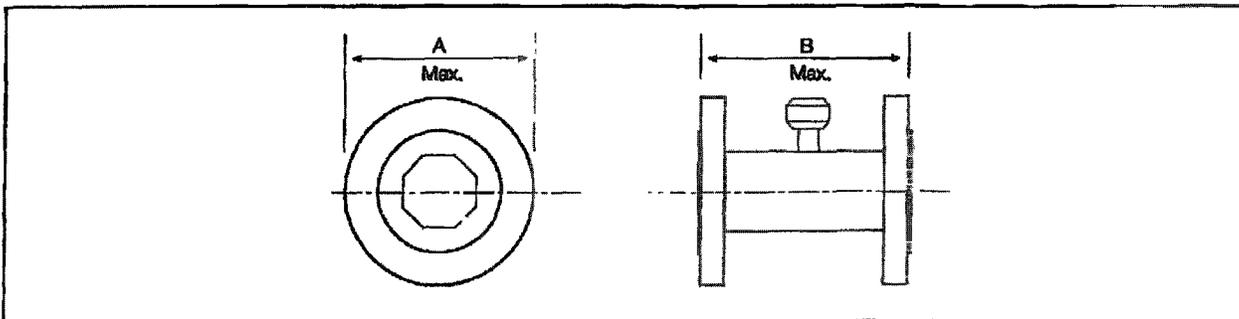


DN10 to 32 (3/8 to 1 1/4 NB) full-bore

Meter Size		Dimensions mm (in)		Approximate Weight	
DN	NPS/NB	A*	B	kg	lb
10	3/8	93 (3.7)	200 (7.9)	6	13.2
15	1/2	95 (3.7)	200 (7.9)	7	15.4
20	3/4	111 (4.4)	200 (7.9)	7	15.4
25	1	120 (4.7)	200 (7.9)	8	17.6
32	1 1/4	137 (5.4)	200 (7.9)	10	22

\*Dimensions are approximate and vary depending on flange type

DN10 to 32 (3/8 to 1 1/4 NB) full-bore



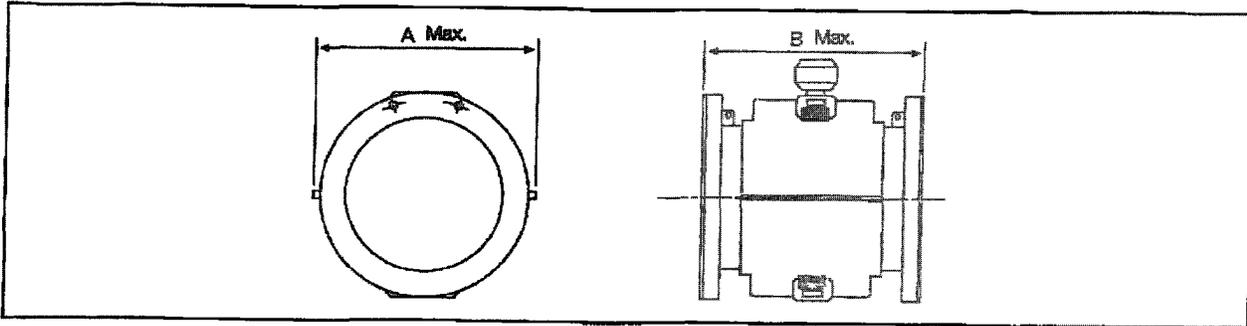
DN40 to 300 (1 1/2 to 12 NB) full-bore

Meter Size		Dimensions mm (in)		Approximate Weight	
DN	NPS/NB	A*	B	kg	lb
40	1 1/2	150 (5.9)	200 (7.9)	11	24
50	2	165 (6.5)	200 (7.9)	12	27
60	3	200 (7.9)	200 (7.9)	15	33
100	4	230 (9.1)	250 (9.8)	18	40
150	6	280 (11.0)	300 (11.8)	31	68
200	8	345 (13.6)	350 (13.8)	48	106
250	10	405 (15.9)	450 (17.7)	75	165
300	12	460 (18.1)	500 (19.7)	112	247

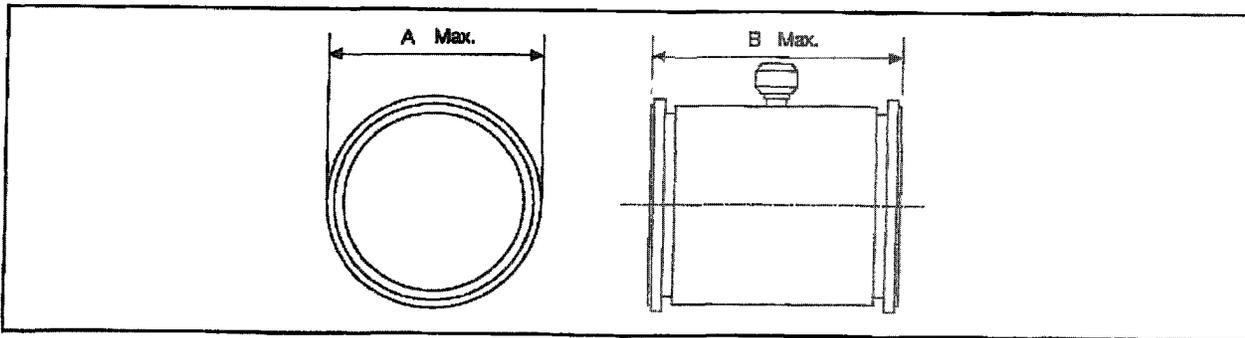
\*Dimensions are approximate and vary depending on flange type

DN40 to 300 (1 1/2 to 12 NB) full-bore

WaterMaster  
Electromagnetic flowmeter



DN250 to 600 (10 to 24 NB) full-bore



DN700 to 2200 (28 to 84 NB) full-bore

Meter Size		Dimensions in mm (in)			Approximate Weight	
DN	NPS/NB	A	B (<PN25)	B (PN25, PN40, ASME, CL300)	kg	lb
250	10	405 (15.99)	450 (17.7)**	488 (19.2)	88	194
300	12	480 (18.1)	500 (19.7)**	538 (21.2)	128	282
350	14	535 (21.1)	550 (21.7)**	568 (22.3)	100	220
400	16	600 (23.6)	600 (23.6)**	618 (24.3)	115	253
450	18	640 (25.2)	698 (27.5)**	698 (27.5)	160	352
500	20	715 (28.1)	768 (30.2)**	768 (30.2)	217	456
600	24	840 (33.1)	918 (36.1)**	918 (36.1)	315	693
700	27/28*	927 (36.5)	700 (27.6)***	-	430	945
780	30	985 (38.8)	762 (30)***	-	430	945
800	32	1080 (41.7)	800 (31.5)***	-	430	945
900	36	1170 (46.1)	900 (35.4)***	-	540	1180
1000	38/40*	1280 (50.8)	1000 (39.4)***	-	720	1585
1050	42	1405 (55.3)	1067 (42)***	-	880	1930
1100	44	1405 (55.3)	1067 (42)***	-	880	1930
1200	48	1511 (59.5)	1200 (47.2)***	-	1000	2160
1400	54	1745 (68.7)	1400 (55.1)***	-	1450	3190
1600	60	1855 (73.0)	1524 (59)***	-	1870	3000
1800	68	2032 (80.0)	1800 (63)***	-	2000	4400
1800	72	2187 (86.5)	2250 (88.6)***	-	2400	5280
2000	78	2362 (93.0)	2500 (98.4)***	-	3200	7040
2200	84	2534 (100.0)	2750 (110)***	-	4200	8300

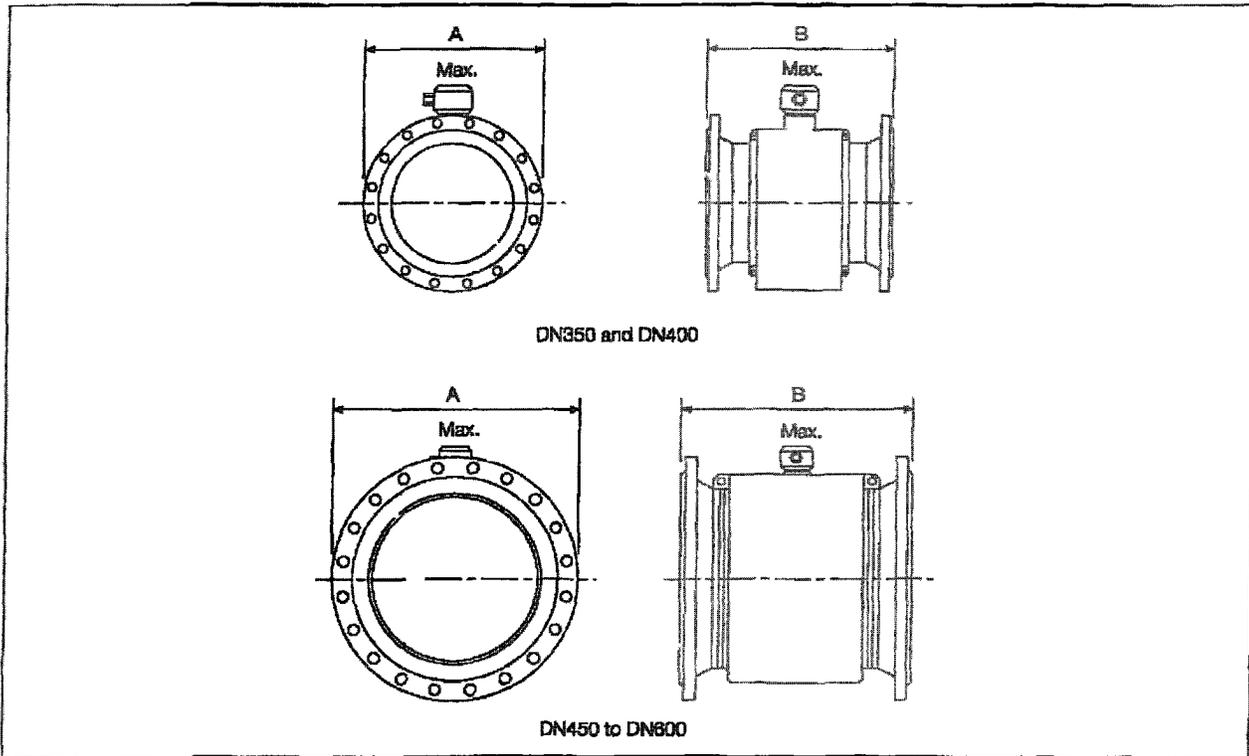
\* Size is dependent on flange specification

Typical tolerances:

\*\* +0/-10 mm (0.40 in)      \*\*\* +0/-20 mm (1.0 in)

DN250 to 2200 (10 to 84 NB) full-bore

**WaterMaster**  
Electromagnetic flowmeter



*DN350 to 600 (14 to 24 NB) FM – approved version*

Meter Size		Dimensions in mm (in)*		Approximate Weight**	
DN	NPS/NB	A	B	kg	lb
350	14	585 (23.0)	560 (21.7)	145	319
400	16	680 (27.2)	600 (23.6)	179	394
450	18	711 (28.0)	686 (27.0)	189	417
500	20	775 (30.5)	752 (29.6)	196	430
600	24	914 (36.0)	914 (36.0)	275	608

\* Sizes are approximate and dependent on flange specification

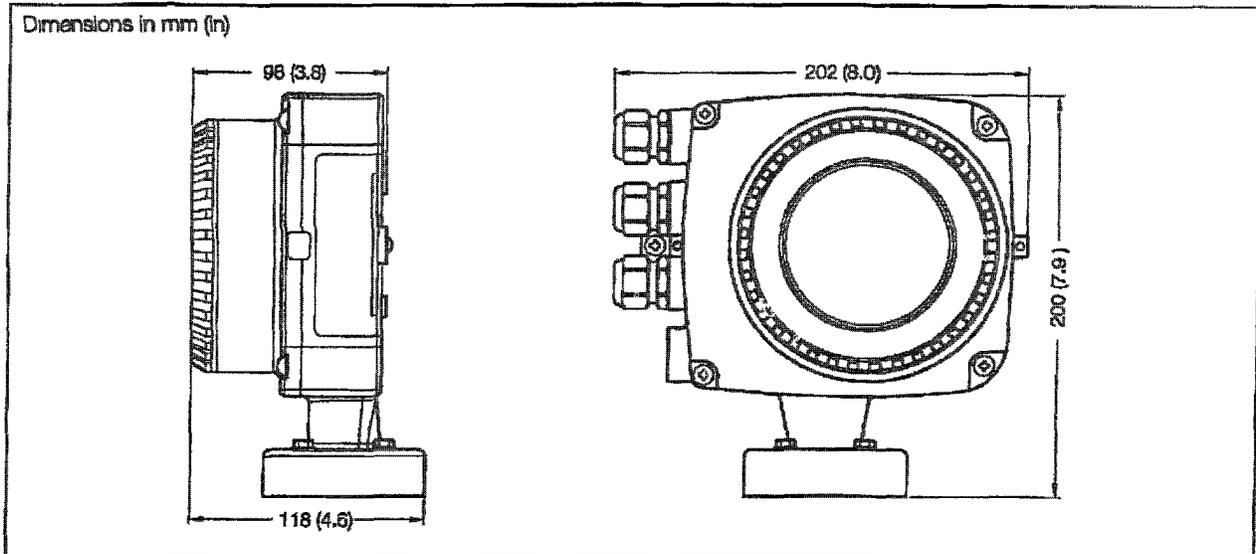
\*\* Approximate weight for Class 150 flanges

*DN350 to 600 (14 to 24 NB) FM – approved version*

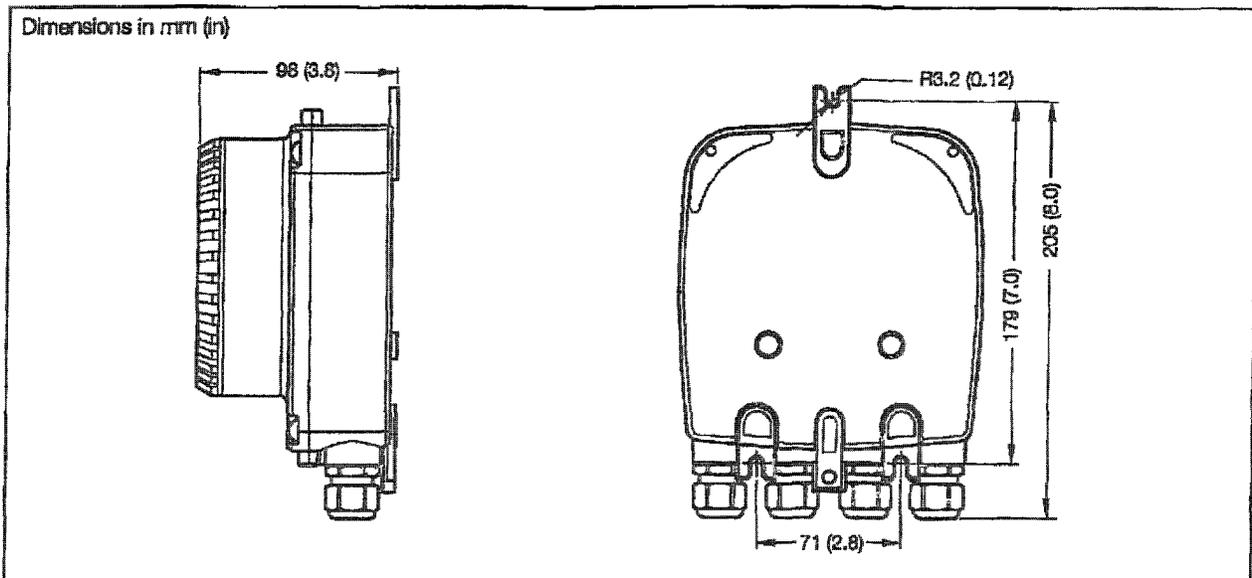
WaterMaster  
Electromagnetic flowmeter

Transmitter dimensions

Integral transmitter

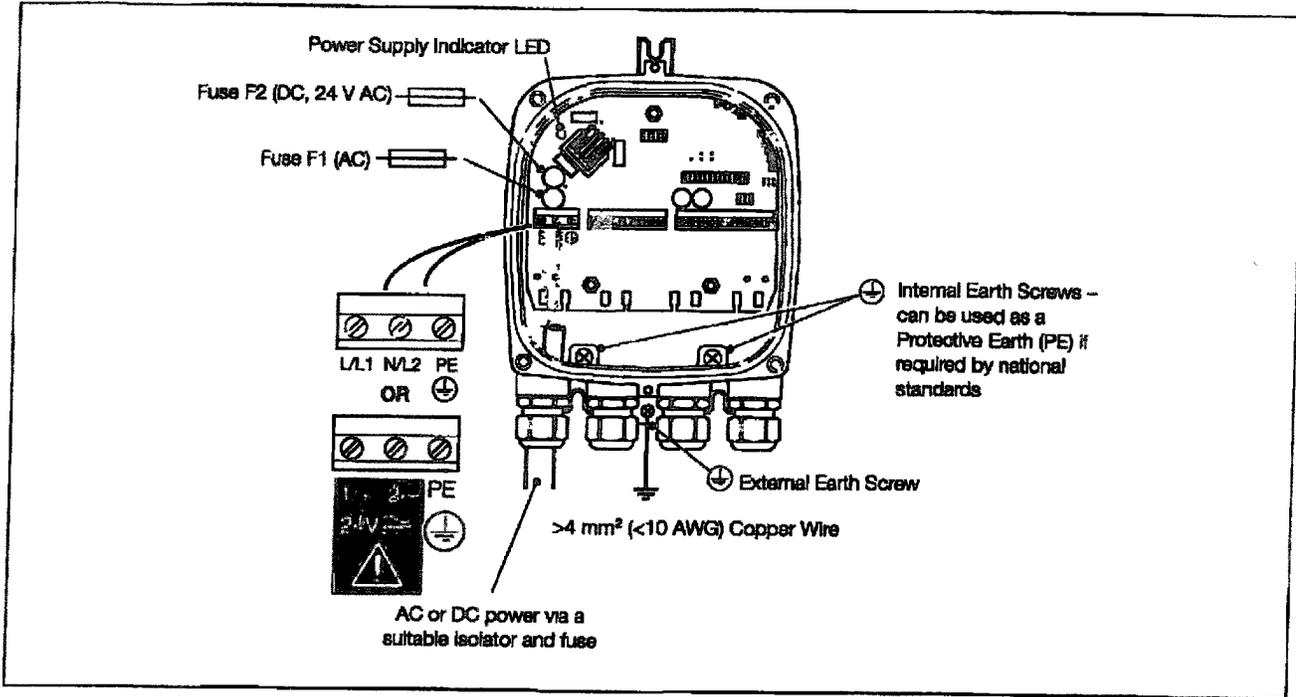


Remote transmitter



**WaterMaster**  
Electromagnetic flowmeter

**Electrical connections**



*AC and DC power supply connections*

**WaterMaster**  
Electromagnetic flowmeter

**Ordering information**

**Electromagnetic flowmeter WaterMaster FEF12 and FEF18**

Variant digit number	1 .. 5	6	7 ... 9	10	11	12	13	14, 15	16	17	18	19	20	21	22	23	24	25	26	27	Options
Flowmeter system, full bore, remote mount	FEF12																				
Full bore sensor only, for use with WaterMaster transmitter / remote	FEF18		XXX	X	X	X	X	XX	X	X	X	X	X	X	X	X	X	X	X	X	
<b>Design</b>																					
Non-hazardous areas		1																			
Hazardous areas (DN≥700)		5																			
<b>Bore diameter</b>																					
DN250 (10 in)		250																			
DN300 (12 in)		300																			
DN350 (14 in)		350																			
DN375 (15 in)		375																			
DN400 (16 in)		400																			
DN450 (18 in)		450																			
DN500 (20 in)		500																			
DN600 (24 in)		600																			
DN700 (28 in)		700																			
30 in		760																			
DN800 (32 in)		800																			
DN900 (36 in)		900																			
DN1000 (40 in)		001																			
42 in		051																			
DN1200 (48 in)		201																			
DN1400 (54 in)		401																			
60 in		501																			
DN1600 (66 in)		601																			
DN1800 (72 in)		801																			
DN2000 (78 in)		002																			
DN2200 (84 in)		202																			
Others		999																			
<b>Liner material</b>																					
Elastomer				K																	
FEP				B																	
Neoprene				C																	
Linatex				J																	
Polyurethane				U																	
<b>Electrode design</b>																					
Standard				1																	
Others				8																	
<b>Measuring electrodes material</b>																					
Stainless steel 316				S																	
Hastelloy® C-22				C																	
Others				Z																	
<b>Grounding accessories</b>																					
Standard				1																	
One potential equalizing ring (stainless steel)				3																	
Two potential equalizing rings (stainless steel)				4																	
Others				9																	

Continued on page 20

WaterMaster  
Electromagnetic flowmeter

		Variant digit number																										Options
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
Flowmeter system, full bore, remote mount		FEF12																										
Full bore sensor only, for use with WaterMaster transmitter / remote		FEF18																										
Signal cable length and type*																												
Without signal cable																												
5 m (15 ft.) cable																												
10 m (30 ft.) cable																												
20 m (60 ft.) cable																												
30 m (100 ft.) cable																												
50 m (165 ft.) cable																												
80 m (260 ft.) cable																												
100 m (325 ft.) cable																												
150 m (490 ft.) cable																												
Special Length > 150 m (> 490 ft.) (and / or armored cable)																												
Explosion protection certification																												
General purpose (non-Ex design)																												
FM Class 1 Div. 2 (DN≥600, DN≤1600)																												
FMc Class 1 Div. 2 (DN≥600, DN≤1600)																												
Others																												
Protection class transmitter / protection class sensor																												
IP67 (NEMA 4X) / IP68 (NEMA 6P) – cable not fitted and not potted																												
IP67 (NEMA 4X) / IP68 (NEMA 6P) – cable fitted and potted																												
Cable conduits *																												
M20 x 1.5																												
NPT 1/2 in																												
M20 SWA armored																												
M20 SWA sensor, output and power connector																												
Power supply																												
Without (FEF18 only)																												
100.. 230 V AC (60 Hz)																												
24 V AC or 24 V DC (60 Hz)																												
100.. 230 V AC (60 Hz)																												
24 V AC or 24 V DC (60 Hz)																												
Input and output signal type																												
HART + 20 mA + pulse + contact output (FEF12 only)																												
PROFIBUS DP RS485 physical layer + pulse + contact output (FEF121 only)																												
Without (FEF181 only)																												
Configuration type / diagnostics type																												
Without (FEF18 only)																												
Factory defaults / standard diagnostics (FEF12 only)																												
Options**																												
Documentation language																												
German	M1	English	M5 (default)																									
Italian	M2	Portuguese	MA																									
Spanish	M3	Russian	MB																									
French	M4	Danish	MF																									
Power supply frequency (sensor FEF 18 only)																												
50 Hz	F5	60 Hz	F6																									

\* The type of signal cable supplied (standard or armored) depends on the type of cable conduit (variant digit number 24) ordered. For FM or FMC Approved versions, NPT only permitted.

\*\*Add codes for options.

WaterMaster  
Electromagnetic flowmeter

Variant digit number		1 ... 5	6	7 ... 9	10	11	12	13	14, 15	16	17	18	19	20	21	22	23	24	25	26	27	Options
Flowmeter system, full bore, remote mount		FEF12																				
Full bore sensor only, for use with WaterMaster transmitter / remote		FEF18		XXX	X	X	X	X	XX	X	X	X	X	X	X	X	X	X	X	X	X	
Signal cable length and type*																						
Without signal cable																						0
6 m (15 ft.) cable																						1
10 m (30 ft.) cable																						2
20 m (60 ft.) cable																						3
30 m (100 ft.) cable																						4
50 m (165 ft.) cable																						5
80 m (260 ft.) cable																						6
100 m (325 ft.) cable																						7
150 m (490 ft.) cable																						8
Special Length > 150 m (> 490 ft.) (and / or armored cable)																						9
Explosion protection certification																						
General purpose (non-Ex design)																						A
FM Class 1 Div. 2 (DN≥600, DN≤1600)																						G
FMC Class 1 Div. 2 (DN≥600, DN≤1600)																						P
Others																						Z
Protection class transmitter / protection class sensor																						
IP67 (NEMA 4X) / IP68 (NEMA 6P) – cable not fitted and not potted																						2
IP67 (NEMA 4X) / IP68 (NEMA 6P) – cable fitted and potted																						3
Cable conduits *																						
M20 x 1.5																						A
NPT 1/2 in																						B
M20 SWA armored																						D
M20 SWA sensor, output and power connector																						F
Power supply																						
Without (FEF18 only)																						0
100.. 230 V AC (50 Hz)																						1
24 V AC or 24 V DC (50 Hz)																						2
100.. 230 V AC (60 Hz)																						3
24 V AC or 24 V DC (60 Hz)																						4
Input and output signal type																						
HART + 20 mA + pulse + contact output (FEF12 only)																						A
PROFIBUS DP RS485 physical layer + pulse + contact output (FEF121 only)																						G
Without (FEF181 only)																						Y
Configuration type / diagnostics type																						
Without (FEF18 only)																						0
Factory defaults / standard diagnostics (FEF12 only)																						1
Options**																						
Documentation language																						
German	M1	English	M5 (default)																			
Italian	M2	Portuguese	MA																			
Spanish	M3	Ruesian	MB																			
French	M4	Danish	MF																			
Power supply frequency (sensor FEF 18 only)																						
50 Hz	F5	60 Hz	F6																			

\* The type of signal cable supplied (standard or armored) depends on the type of cable conduit (variant digit number 24) ordered.  
For FM or FMC Approved versions, NPT only permitted.  
\*\*Add codes for options.

**WaterMaster**  
Electromagnetic flowmeter

**Electromagnetic flowmeter WaterMaster FEV11, FEV12 and FEV18**

Variant digit number		1 ... 5	6	7 ... 9	10	11	12	13	14, 15	16	17	18	19	20	21	22	23	24	25	26	27	Options
Flowmeter system, optimized full bore, integral mount		FEV11																				
Flowmeter system, optimized full bore, remote mount		FEV12																				
Optimized full bore sensor only, for use with WaterMaster transmitter/remote		FEV18																				
<b>Design</b>																						
Non-hazardous areas																						1
Hazardous areas																						6
<b>Bore diameter</b>																						
DN40 (1½ in)																						040
DN50 (2 in)																						050
DN80 (3 in)																						080
DN100 (4 in)																						100
DN125 (5 in)																						125
DN150 (6 in)																						150
DN200 (8 in)																						200
<b>Liner material</b>																						
Polypropylene																						V
<b>Electrode design</b>																						
Standard																						1
<b>Measuring electrodes material</b>																						
Stainless steel 316																						S
Hastelloy® C-22																						C
<b>Grounding accessories</b>																						
Standard																						1
One potential equalizer ring																						3
Two potential equalizer rings																						4
<b>Process connection type</b>																						
Flanges ASME B16.5 class 150																						A1
Flanges AS 4087 PN21 (≥ DN50 [2 NB])																						E0
Flanges AS 4087 PN16 (≥ DN50 [2 NB])																						E1
Flanges AS 4087 PN14																						E2
Flanges AS 2129 Table F																						E3
Flanges AS 2129 Table E																						E4
Flanges AS 2129 Table D																						E5
Flanges AS 2129 Table C																						E6
Flanges JIS 7 5K (≥ DN80 [3 NB])																						J0
Flanges JIS 10K																						J1
ISO/EN PN10																						S1
ISO / EN PN16 (≥ DN50 [2 NB])																						S2
ISO / EN PN40 (DN40 [1½ NB] only) 16 bar rated																						S4
<b>Process connection material</b>																						
Carbon steel flanges																						B
<b>Usage certifications</b>																						
Standard																						1
<b>Calibration type</b>																						
Class 2 Calibration – standard accuracy 0.4 %, OIML® R49 Approved																						A
Class 1 Calibration – enhanced accuracy 0.2 %, OIML® R49 Approved																						B
Class 2 Calibration – standard accuracy 0.4 %, OIML® R49 with VeriMaster																						D
Class 1 Calibration – high accuracy 0.2 %, OIML® R49 with VeriMaster																						H
Class 2 Extended Range Calibration – standard accuracy 0.4 %, MID* with VeriMaster																						V
Class 1 Extended Range Calibration – high accuracy 0.2 %, MID* with VeriMaster																						S

\* OIML & MID options are available only in FEV, DN40, DN50, DN80, DN100, DN125, DN150, DN200

Continued on page 23

**WaterMaster**  
Electromagnetic flowmeter

Variant digit number	1 ... 5	6	7 ... 9	10	11	12	13	14, 15	16	17	18	19	20	21	22	23	24	25	26	27	Options
Flowmeter system, optimized full bore, integral mount	FEV11																				
Flowmeter system, optimized full bore, remote mount	FEV12		XXX	X	X	X	X	XX	X	X	X	X	X	X	X	X	X	X	X	X	
Optimized full bore sensor only, for use with WaterMaster transmitter/remote	FEV18																				
Temperature range installation / ambient temperature range																					
Standard design / -20 .. 60 °C (-4 .. 140 °F)																					1
Nameplate																					
Adhesive																					A
Signal cable length and type *																					
Without signal cable																					0
6 m (15 ft.) cable (FEV12 and FEV18 only)																					1
10 m (30 ft.) cable (FEV12 and FEV18 only)																					2
20 m (60 ft.) cable (FEV12 and FEV18 only)																					3
30 m (100 ft.) cable (FEV12 and FEV18 only)																					4
50 m (165 ft.) cable (FEV12 and FEV18 only)																					5
60 m (200 ft.) cable (FEV12 and FEV18 only)																					6
100 m (325 ft.) cable (FEV12 and FEV18 only)																					7
150 m (490 ft.) cable (FEV12 and FEV18 only)																					8
Special Length > 150 m (> 490 ft.) (FEV12 and FEV18 only)																					9
Explosion protection certification																					
General purpose (non-Ex design)																					A
FM Class 1 Div. 2																					G
FMC Class 1 Div. 2																					P
Others																					Z
Protection class transmitter / protection class sensor																					
IP67 (NEMA 4X) / IP67 (NEMA 4X) - integral (FEV11 only)																					1
IP67 (NEMA 4X) / IP68 (NEMA 6P) - cable not fitted and not potted (FEV12 and FEV18 only)																					2
IP67 (NEMA 4X) / IP68 (NEMA 6P) - cable fitted and potted (FEV12 and FEV18 only)																					3
Cable conduits *																					
M20 x 1.5																					A
NPT 1/2 in																					B
M20 SWA armored (FEV121 and FEV181 only)																					D
M20 SWA sensor, output and power connector (FEV121 and FEV181 only)																					F
Power supply																					
Without (FEV181 only)																					0
100... 230 V AC, 50 Hz																					1
24 V AC or 24 V DC, 60 Hz																					2
100... 230 V AC, 60 Hz																					3
24 V AC or 24 V DC, 60 Hz																					4
Others																					9
Input and output signal type																					
HART + 20 mA + pulse + contact output (FEV11 and FEV12 only)																					A
PROFIBUS DP RS485 physical layer + pulse + contact output (FEV111 and FEV121 only)																					G
Without (FEV181 only)																					Y
Configuration type / diagnostics type																					
Without (FEV18 only)																					0
Factory defaults / standard diagnostics (FEV11 and FEV12 only)																					1
Options**																					
Documentation language																					
German M1	English	M5 (default)																			
Italian M2	Portuguese	MA																			
Spanish M3	Russian	MB																			
French M4	Danish	MF																			
Power supply frequency (sensor FEV18 only)																					
50 Hz F5	60 Hz	F6																			

\* The type of signal cable supplied (standard or armored) depends on the type of cable conduit (variant digit number 24) ordered.  
For FM or FMC Approved versions, NPT only permitted.

\*\*Add codes for options.

WaterMaster  
Electromagnetic flowmeter

Electromagnetic flowmeter transmitter for WaterMaster FET10 and FET12

	Variant digit number															Options
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Transmitter cartridge	FET10															
Remote transmitter	FET12			X	X	X	X	X	X	X	X	X	X	X	X	X
<b>Design</b>																
Non-hazardous area	1															
Hazardous area	5															
<b>Temperature range installation / ambient temperature range</b>																
Standard design / -20 ... 60 °C (-4 ... 140 °F)	1															
<b>Nameplate</b>																
Adhesive			A													
<b>Signal cable length and type</b>																
Without signal cable			0													
<b>Explosion protection certification</b>																
Without (transmitter only)																Y
FM Class 1 Div 2																G
FMc Class 1 Div. 2																P
Others																Z
<b>Protection class transmitter / protection class sensor</b>																
IP67 (NEMA 4X) / IP67 (NEMA 4X)																1
<b>Cable conduits</b>																
M20 x 1.5 (FET121 only)																A
NPT 1/2 in (FET121 only)																B
M20 SWA armored (FET121 only)																D
M20 Plastic power/output + M20 SWA armored sensor cable entry (FET121 only)																F
<b>Power supply</b>																
100... 230 V AC																1
24 V AC or 24 V DC																2
<b>Input and output signal type*</b>																
HART + 20 mA + pulse + contact output																A
PROFIBUS DP RS485 physical layer + pulse + contact output (FET101 and FET121 only)																G
<b>Configuration type / diagnostics type</b>																
Factory defaults/standard diagnostics																1
<b>Options**</b>																
<b>Documentation language</b>																
German	M1	English	M5 (default)													
Italian	M2	Portuguese	MA													
Spanish	M3	Russian	MB													
French	M4	Danish	MF													

\*The transmitter cartridge Input and Output Signal Type must match the transmitter backplane output configuration (HART or PROFIBUS) – see IM/WM.

\*\*Add codes for options.

WaterMaster  
Electromagnetic flowmeter

Electromagnetic flowmeter WaterMaster – FEW11, FEW12 and FEW18

Variant digit number		1	2	3	4	5	6	7	8	9	10	11	12	13	14, 15	16	17	18	19	20	21	22	23	24	25	26	27	Options
Flowmeter system – full bore, integral mount (DN10 to DN32 Only)	FEW11																											
Flowmeter system – full bore, remote mount	FEW12							XXX	X	X	X	X	X		XX	X	X	X	X	X	X	X	X	X	X	X	X	
Full bore sensor only – for use with WaterMaster transmitter/remote	FEW18																											
<b>Design</b>																												
Non-hazardous areas		1																										
Hazardous areas		5																										
<b>Bore diameter</b>																												
DN10 (3/8 in)		010																										
DN15 (1/2 in)		015																										
DN20 (3/4 in)		020																										
DN25 (1 in)		025																										
DN32 (1 1/4 in)		032																										
DN350 (14 in) (FEW12 and FEW 18 only)		350																										
DN400 (16 in) (FEW12 and FEW 18 only)		400																										
DN450 (18 in) (FEW12 and FEW 18 only)		450																										
DN500 (20 in) (FEW12 and FEW 18 only)		500																										
DN600 (24 in) (FEW12 and FEW 18 only)		600																										
<b>Liner material</b>																												
PTFE (DN10 to 32 only)		A																										
Elastomer NSF (DN350 to 600 only)		M																										
<b>Electrode design</b>																												
Standard		1																										
Other		9																										
<b>Measuring electrodes material</b>																												
Hastelloy® C-4 (2.4610) – DN10 to DN32		D																										
Stainless steel 316 (1.4571) – DN350 to DN600		S																										
<b>Grounding accessories</b>																												
Not required		0																										
One potential equalizing ring (stainless steel)		3																										
Two potential equalizing rings (stainless steel)		4																										
Other		9																										

Continued on page 28

WaterMaster  
Electromagnetic flowmeter

Variant digit number	1 ... 5	6	7 ... 9	10	11	12	13	14, 15	16	17	18	19	20	21	22	23	24	25	26	27	Options	
Flowmeter system - full bore, integral mount (DN10 to DN32 Only)	FEW11																					
Flowmeter system - full bore, remote mount	FEW12		XXX	X	X	X	X	XX	X	X	X	X	X	X	X	X	X	X	X	X		
Full bore sensor only - for use with WaterMaster transmitter/remote	FEW18																					
<b>Process connection type</b>																						
ASME B16.5 B class 150																						A1
ASME B16.5 B class 300																						A3
ISO / EN PN40 - DN10 to DN32 only																						S4
Other																						Z9
<b>Process connection material</b>																						
Carbon steel flanges - DN20 to DN32 and DN350 to DN800																						B
Stainless steel flange 1.4571 (316 Ti) - DN10 to DN15																						D
Other																						Z
<b>Usage certifications</b>																						
Standard (without PED)																						1
Other																						9
<b>Calibration type</b>																						
Class 2 calibration - without fingerprint																						A
Class 1 calibration - without fingerprint																						B
Class 2 calibration - with VeriMaster																						D
Class 1 calibration - with VeriMaster																						H
<b>Temperature range installation / ambient temperature range</b>																						
Standard design / -20 .. 80 °C (-4 ... 140 °F)																						1
<b>Nameplate</b>																						
Adhesive																						A
<b>Signal cable length and type</b>																						
Without signal cable																						0
5 m (15 ft.) cable																						1
10 m (30 ft.) cable																						2
20 m (60 ft.) cable																						3
30 m (100 ft.) cable																						4
50 m (165 ft.) cable																						5
80 m (260 ft.) cable																						6
100 m (325 ft.) cable																						7
150 m (490 ft.) cable																						8
Special length or cable type																						9
<b>Explosion protection certification</b>																						
General purpose																						A
FM Class 1 Div. 2																						G
FMc Class 1 Div. 2																						P
Others																						Z

Continued on page 27

WaterMaster  
Electromagnetic flowmeter

Variant digit number	1	...	5	6	7	...	9	10	11	12	13	14, 15	16	17	18	19	20	21	22	23	24	25	26	27	Options																						
Flowmeter system – full bore, integral mount (DN10 to DN32 Only)	FEW11																																														
Flowmeter system – full bore, remote mount	FEW12																							XXX	X	X	X	X	XX	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Full bore sensor only – for use with WaterMaster transmitter/remote	FEW18																																														
<b>Protection class transmitter / protection class sensor</b>																																															
IP67 (NEMA 4X) / IP67 (NEMA 4X) – cable not fitted and potted to sensor (DN10 to DN32 only)																							1																								
IP67 (NEMA 4X) / IP68 (NEMA 6P) – cable not fitted and potted to sensor (DN350 to DN600 only)																							2																								
IP67 (NEMA 4X) / IP68 (NEMA 6P) – cable fitted and potted to sensor (DN350 to DN600 only)																							3																								
IP67 (NEMA 4X) / IP67 (NEMA 4X) – cable fitted and potted to sensor (DN10 to DN32 only)																							7																								
<b>Cable conduits *</b>																																															
M20 (Plastic) – glands: all 20 mm plastic																							A																								
NPT 1/2 in (blanked) – no glands or conduit adaptors supplied																							B																								
M20 SWA (armored) – glands: all 20 mm armored																							D																								
M20 SWA sensor, M20 others – glands: 20 mm armored for sensor connections, plastic for other connections																							F																								
Not required																							Y																								
Other																							Z																								
<b>Power supply</b>																																															
Without																							0																								
100... 230 V AC, 50 Hz																							1																								
24 V AC or 24 V DC, 50 Hz																							2																								
100... 230 V AC, 60 Hz																							3																								
24 V AC or 24 V DC, 60 Hz																							4																								
<b>Input and output signal type</b>																																															
HART + 20 mA + pulse + contact output																							A																								
PROFIBUS DP RS485 physical layer and contact output (FEW111 and FEW121 only)																							G																								
Without																							Y																								
<b>Configuration type / diagnostics type</b>																																															
Not required (FEW18 only)																							0																								
Standard / Standard (FEW11 and FEW12 only)																							1																								
<b>Options**</b>																																															
<b>Documentation language</b>																																															
German	M1	English	M5 (default)																																												
Italian	M2	Portuguese	MA																																												
Spanish	M3	Russian	MB																																												
French	M4	Danish	MF																																												
<b>Power supply frequency (sensor FEW 18 only)</b>																																															
50 Hz	F5	60 Hz	F6																																												

\* For FM or FMC Approved versions, NPT only permitted.

\*\* Add codes for options.

## Contact us

**ABB Limited**  
**Process Automation**  
Oldends Lane  
Stonehouse  
Gloucestershire GL10 3TA  
UK  
Tel: +44 1453 826 661  
Fax: +44 1453 829 671

**ABB Inc.**  
**Process Automation**  
125 E. County Line Road  
Warminster  
PA 18974  
USA  
Tel: +1 215 674 6000  
Fax: +1 215 674 7183

[www.abb.com](http://www.abb.com)

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