Rock River Water Reclamation District
Sampling/Monitoring Manhole Installation
Application for Approval
General Instructions

1) Prior to installing a sampling or monitoring manhole, the Application for Approval needs to be submitted to the District. The Industrial/Commercial User (I/CU), his agent or plumber, must satisfactorily comply with these instructions and receive a service connection permit from District Engineering prior to construction.

2) Upon receipt, District Engineering and Plant Operations staff will review the Application for Approval of the manhole installation. The review period is seven days. If additional information is required, District staff will contact the applicant.

3) When the completed Application for Approval is reviewed and found to be in compliance with all requirements, the form will be signed by the Plant Operations and Engineering Departments and the permit will be issued subject to prior approval of the Industrial/Commercial User Questionnaire and payment of any connection fees.

4) Specific details discussing the District requirements for a sampling manhole and a monitoring manhole for flow measurement purposes may be found in the attached “Sampling/Monitoring Manhole Specifications and Installation Requirements.”

5) The District Engineering Department must be contacted at least twenty-four (24) hours prior to the start of the manhole installation work to arrange for an inspector.

6) Specific instructions for completing the respective sections of the application are:

SECTION I - General Information (Self explanatory)

SECTION II - Manhole Detail Drawing
Submit appropriate manhole detail. The drawings must specify if the manhole is a sampling manhole, monitoring manhole or enhanced monitoring manhole.

SECTION III - Site Plan
Submit site plan showing the industrial/commercial site, including building location. Site plan should also include existing sanitary sewer upstream and downstream of the proposed manhole.

SECTION IV - Flow Meter Detail
For a flow monitoring manhole, provide information about the type and size of primary device, type of flow meter, if required, and the flow meter location.

SECTION V - Installation Date
Provide the date you estimate for installation of the sampling manhole.
I. MONITORING FACILITIES REQUIRED

District Code of Ordinances, Title 2, requires monitoring facilities to allow inspection, sampling, and wastewater flow measurement of the building sewer or internal drainage systems for certain industrial and commercial users. Should the District require part or all of the above, the following specifications should be adhered to unless prior approval from the District is obtained. Before proceeding with the design and construction of a Sampling/Monitoring Manhole, be sure that you know exactly where the particular discharge line is located and that it does not contain wastewater flow from sources other than your plant discharge.

II. GENERAL

1. Where applicable, the District may require the installation of one of three various types of Sampling/Monitoring Manholes [See Industrial/Commercial User (I/CU) connection permit application for required equipment]:

   A. Sampling manhole: 4’ diameter
   B. Monitoring manhole: 4’ or 5’ diameter with flume
   C. Enhanced monitoring manhole: 5’ diameter with flume, flow meter and dedicated electric power supply
   D. Sewer Viewer

2. All manholes installed for sampling and monitoring purposes shall have a Neenah R-1670 (or equivalent), self sealing, non-rocking frame and concealed pickhole lid. The first step shall be no greater than 30 inches from the top of the manhole frame as per the attached standard manhole detail. The steps must be vertically aligned.

3. Sampling and monitoring manholes must be located on the property of the discharger whose wastewater will be sampled. The manhole shall be safely, easily and independently accessible to authorized representatives of the District from 7:00 a.m. to 5:00 p.m., seven days per week. The manhole shall be located so the entrance to the manhole cannot be blocked by parked vehicles, landscaping, or other activities of the discharger. The site shall be graded such that the manhole is accessible in all types of weather; it shall not be located in a potential ponding area.

   NOTE: Access to the manhole must be granted by owner.

4. Before construction on any new sampling manhole, consult the District Engineering Department on the proposed location and submit a set of drawings showing the Manhole Detail and a Site Plan for the manhole location for review and approval. [See attached sample of Site Plan to be
used] On-site meetings between District personnel and the contractor may be required.

5. Twenty-four hours prior to starting the installation of the manhole, the District Engineering Department shall be notified so that a District representative might be present. **CALL THE DISTRICT AT 387-7667 TO SCHEDULE AN INSPECTION AT LEAST 24 HOURS PRIOR TO COMPLETION.**  
   **NOTE:** Fees are charged for inspection based upon current District ordinances.

III. **SAMPLING MANHOLE REQUIREMENTS**

Sampling manholes shall be 4’ or (5’ I.D.) as per Figure 1. Sampling manholes shall be located in discharge lines which contain only wastewater flows from the Industrial/Commercial User being sampled. Verification of this shall be the responsibility of the discharger.

IV. **MONITORING MANHOLES**

Monitoring manholes shall be 4’ or 5’ I.D. as per Figure 2 and contain the following equipment installed in a permanently fixed position acceptable to the District and equipment supplier:

1. A Palmer Bowlus flume incorporated into the invert, or equivalent primary device, shall be approved by the District Engineering. The primary device must be properly sized to accurately monitor the range of flows produced by the discharger.

2. Monitoring manholes shall not have any side sewers entering the manhole. The invert must be straight without any “Ts” or “Ys” or bends as per Figure 3. The manhole shall be installed in a location which will allow for proper mixing of all wastewater discharge sewers and have a minimum of 25 pipe diameters of straight pipe upstream of the manhole; recommended standards for unobstructed downstream pipe should also be observed. Flume installation details are found in Appendix 1. The flume must be installed to provide a smooth, level flow for sampling and flow monitoring. Consult with the equipment manufacturer or factory representative for specific installation instructions.

3. The monitoring manhole shall be located in discharge lines which contain only wastewater flows from the Industrial/Commercial User being monitored. The verification of this shall be the responsibility of the discharger.

V. **ENHANCED MONITORING MANHOLES**

Enhanced monitoring manholes shall be 5’ I.D. as per Figure 2 and contain the following equipment installed in a permanently fixed position by the user:

1. A Palmer Bowlus Flume incorporated into the invert, or equivalent primary device approved by District Engineering. The primary device must be
properly sized to accurately monitor the range of flows produced by the discharges.

2. A dedicated source of 110 volt, 20 amp, grounded electrical power shall be provided to the manhole to operate all equipment in the sampling chamber. The dedicated source shall be provided with a water tight receptacle box with two female outlets. The receptacle shall be mounted 12” above the top step and 90° from the step. The point of entry through the manhole wall shall be properly sealed at both sides of the manhole to keep out moisture. All work shall conform to the latest edition of the National Electrical Code. This power supply shall be protected by a Ground Fault Interrupter (GFI).

3. An open channel flow meter is required for enhanced monitoring manholes. A signal cable shall be installed from the metering device to a point in the sampling manhole which is accessible to the District sampling equipment. The automatic samplers require a 12 volt DC pulse or an isolated contact closure of at least 24 millisecond duration. The District samplers may be used with flow meters having a 4-20 ma output proportional to flow rate. A special interface device to convert an analog output signal into one compatible with the sampler may be required. All work shall comply with the latest edition of the National Electrical Code.

4. All monitoring manholes shall not have any side sewers entering the manhole. The invert must be straight without any “Ts”, “Ys” or bends as per Figure 3. The manhole shall be installed in a location which will allow for proper mixing of all wastewater discharge sewers and have a minimum of 25 pipe diameters of straight pipe upstream of the manhole. Flume installation details are found in Appendix 1. The flume must be installed to provide a smooth, level flow for sampling and flow monitoring. Consult with the equipment manufacturer or factory representative for specific installation instructions.

5. Enhanced Monitoring Manholes shall be located in a discharge line which contains only wastewater flows from the Industrial/Commercial User being sampled. Verification of this condition shall be the responsibility of the discharger.

VI. FACILITY OWNER’S RESPONSIBILITY

When required by the District, the owner or user of the facility shall install, at his expense, a Sampling, Monitoring, or Enhanced Monitoring Manhole. This manhole shall be installed in accordance with plans and specifications approved by the District. Such monitoring facility, all required equipment, including, but not limited to, primary flow measuring devices, flow meter, dedicated electric power and flow meter signal line shall be provided and maintained by the owner or user.

When required, the user shall perform routine maintenance and recalibration of all sewage flow meters at least semi-annually. Such maintenance and recalibration shall be performed by a factory representative or equivalent third party who shall submit written certification to the District.
LIST OF FIGURES/APPENDICES

Figure 1 - Requirements for a 4' I.D. or sampling manhole

Figure 2 - Requirements for a 4' or 5' I.D. Monitoring/Enhanced Monitoring Manhole.

Figure 3 - Monitoring manhole top view diagrams of properly and improperly installed invert channels for monitoring and enhanced monitoring manholes.

Figure 4 - Example site plan.

Figure 5 - Typical manhole requirements for various Industrial/Commercial Users.

Appendix 1 - Flume installation (NOTE: For illustrative purposes only. The use of “brand” name does not constitute endorsement by the District).

If you have any questions, please contact the Rock River Water Reclamation District Industrial Waste Surveillance Department at (815) 387-7635 or the Engineering Department at (815) 387-7555.
**SAMPLING MANHOLE DETAIL**

**FIGURE 1**

**NOTES:**

MANHOLE STRUCTURE TO BE CONSTRUCTED OF PRE-CAST REINFORCED CONCRETE.

MANHOLE ROOF PIPE CONSTRUCTION SHALL CONFORM TO A.S.T.M. C-498-90 OR LATEST DESIGNATION.

MANHOLE FRAME AND COVER SHALL BE HEAVY-FR-18G2 NON-ROCKING, SELF-SEALING LID OR EQUIVALENT, UNLESS NOTED OTHERWISE.

ALL ADJUSTMENT RING JOINTS SHALL BE INCORPORATED WITH 3 1/2" X 3/8" X 2 3/4" STCK. LENT SEAL OR EQUIVALENT ON THE LAP.

IN WET AREAS, AN ADDITIONAL 1" GASKET OF X 2 3/4" STCK. LENT SEAL OR EQUIVALENT SHALL BE EMBEDDED ON THE FLAT PORTION OF THE LAP.

WHEN A CASTING REQUIRES PITCHING, A MINIMUM OF THREE SHAMES (PLASTIC OR METAL) EQUALLY SPACED TO PREVENT ROCKING SHALL BE INSTALLED BETWEEN THE CASTING AND THE MASONRY. HYDRAULIC CEMENT SHALL BE PLACED TO FILL ALL SPACE BETWEEN THE CASTING AND MASONRY.

6" (2" MANHOLE WALL THICKNESS SHALL BE 6" INCH. (MANHOLE))

PRE-CAST FLAT TOPS WILL NOT BE PERMITTED ON DISTRICT MANHOLES.

THE CONTRACTOR SHALL TAKE EXTREME CARE TO DRAIN AND COMFORT SHAVES FROM MANHOLE BRICKWORK SUCH THAT IT MEETS R.R.W.C. DENSITY REQUIREMENTS.

MAXIMUM DISTANCE OF ANY EXTERNAL PIPE INVERT TO OUTLET PIPE INVERT IS 24".

THE MINIMUM DROP FROM THE FLOWLINE OF ANY PIPE IN A MANHOLE TO THE BENCH UNDER THAT PIPE SHALL BE 6".

THIS INCLUDES STANDARD DROPS AND MANHOLE CONSTRUCTION OVER EXISTING SEwers.

PIPE CONNECTION TO PROPOSED MANHOLE SHALL BE MADE WATER-TIGHT BY MEANS OF RUBBER GASKET SEAL (4-LIC OR EQUIVALENT), CONFORMING TO A.S.T.M. C-157. CAST INTEGRALLY IN MANHOLE WALL OR RUBBER GASKET SEAL AND STAINLESS STEEL CLAMP CONFORMING TO A.S.T.M. C-923.

PIPE CONNECTION TO EXISTING MANHOLE SHALL BE MADE WATER-TIGHT BY MEANS OF RUBBER GASKET SEAL AND STAINLESS STEEL CLAMP CONFORMING TO A.S.T.M. C-923. PIPE SERIES SLOR EQUIVALENT.

PIPE ACCESS SHALL BE MADE BY CORE DRILLING MANHOLE WALL.

MANHOLE LOCATED OUTSIDE PUBLIC RIGHT-OF-WAY MUST BE MARKED WITH A METAL FENCE POST.

**REVISION DATE:** MARCH 1, 1987

**DATE:** APRIL 22, 1994

**DRAWN:** D. MARSH

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**DATE:** APRIL 22, 1994
STANDARD SAMPLING/MONITORING MANHOLE

- TOP VIEW DIAGRAMS -

FIGURE 3

CORRECT INSTALLATION

NO SCALE/PICTORIAL ONLY

25 PIPE DIAMETERS MINIMUM

FLOW

DIMENSION VARIES

NOTE:
THERE SHALL NOT BE ANY BENDS, DROP MANHOLE FLOW JUNCTIONS, ETC. WITHIN 25 PIPE DIAMETERS UPSTREAM OF THE FLUME.

DIAGRAM "A"

INCORRECT INSTALLATIONS

NO SCALE/PICTORIAL ONLY

FLOW

DIAGRAM "B"

DIAGRAM "C"

FLOW

FLOW

FLOW

FLOW

DIAGRAM "D"

FLOW

FLOW

FLOW

FLOW

NOTES:

DIAGRAM "A" IS COMPATIBLE FOR THE INSTALLATION OF A FLUME IN THE INVERT.

DIAGRAMS "B", "C", "D" ARE NOT SUITABLE FOR THE INSTALLATION OF A PALMER BOWLUS FLUME, OR ANY PRIMARY FLOW MEASURING DEVICE DUE TO THE LOCATION OF THE SIDE SEWERS OR A BEND IN THE INVERT CHANNEL.

DRAWN BY: C. ATKINSON    DATE: APRIL 30, 1996
SAMPLE OF SITE PLAN

COMPANY NAME
ADDRESS
CITY, STATE ZIP CODE

NOTES:
1) INDICATE A NUMBER FOR EACH MONITORING OR SAMPLING MANHOLE.
2) INDICATE SEWER SIZES (DIAMETERS).
3) INDICATE LOCATION OF WATER METER OR SEWAGE FLOW METER.
4) DETAILS OF MONITORING AND SAMPLING MANHOLES MUST BE SUBMITTED ON SEPARATE SHEET(S).
5) INDICATE PRIMARY MEASURING DEVICE TYPE AND SIZE.
6) SUBMIT VENDOR INFORMATION ON METERING EQUIPMENT.
FIGURE 5
Typical Manhole Requirements for Various Industrial/Commercial Users

<table>
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<th>Manhole Type (1)</th>
<th>Monitoring Manhole</th>
<th>Enhanced Monitoring Manhole</th>
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<tr>
<td>Restaurants</td>
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<td>Food Manufacturing</td>
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<tr>
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<td>Photo Finisher</td>
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</tr>
<tr>
<td>Auto Center</td>
<td>Printers</td>
<td>Electroplaters/Metal Finishers</td>
</tr>
<tr>
<td>Commercial Laundry</td>
<td>Fabricated Metal Products</td>
<td>Chemical Manufacturing</td>
</tr>
<tr>
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<td>Machinery Manufacturing</td>
<td>Industrial Laundry</td>
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<tr>
<td>Commercial Multi-Tenant Building</td>
<td>Heat Treaters</td>
<td>Commercial Dairy</td>
</tr>
<tr>
<td>Foundries</td>
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<td></td>
</tr>
</tbody>
</table>

(1) These examples are provided for illustrative purposes only. Specific manhole requirements will be made on a case-by-case basis.
PALMER BOWLUS FLUME

Ease of Installation

The Palmer Bowlus flume was one of the first flumes developed specifically for wastewater measurements. This resulted in a U-shaped design that makes the Palmer Bowlus flume the simplest of all flumes to install in an existing channel or in a new installation with minimal construction costs.

Manning offers the Palmer Bowlus flume in four configurations to best handle each user's particular application:

- **Permanent Flume**: This flume is designed for use in new construction, and installed in place of an equivalent length of pipe. An integral upstream approach section assures a smooth flow transition into the flume.

- **Invert Flume**: This design allows for installation in existing channels. The outside diameter of the flume approximates the inside diameter of the pipe. The unit is sealed into the half section (invert) of the pipe by grouting or an adhesive bonding, or held down by sand bags.

- **Exit-Pipe Flume**: A modification of the Invert Flume, allowing the flume to be inserted into the exit pipe of the manhole. This is desirable where limited space is a factor in placing the level sensor. This method allows for additional space for the upstream monitoring installation.

**Quick-Insert (Portable)**: This unique portable flume eliminates the often time-consuming and messy job of installing standard weirs or flumes in sewer lines. For temporary installations, where accuracies better than those obtained from the Manning round pipe equation are desired, this unit becomes the ideal primary device. The flume is supplied with an inflatable rubber sealing ring on the exit section of the flume. It is installed in the exit pipe of the manhole invert and sealing ring is inflated, sealing off the flow. The liquid then flows directly thru the flume. A leveling bracket and fishesly level on the flume assure correct alignment.
Accurate
With proper installation, the Palmer Bowlius flume offers accuracies comparable to the Parshall flume. With the use of sensitive flow instrumentation, accurate flow data can be expected from 10% to 95% of the pipe capacity. The Palmer Bowlius design is unaffected by downstream depth of flow (submergence) up to 80% of upstream depth. To assure maximum accuracies, sizing of Palmer Bowlius flumes should be based on expected flow volumes rather than channel or pipe size. In many cases, large sewer lines may have very low flows, therefore, a smaller flume is the most desirable. When this situation occurs, the permanent type flume must be used with end bulkheads to match the larger size channel.

Rugged
The fiberglass reinforced polyester construction affords excellent corrosion resistance. Smooth, white gel coated inside surfaces minimize any build-up of organisms. The one piece prefabricated design with integral spreaders assures total dimensional stability. A minimum wall thickness of 3/16" throughout is provided in the smaller flumes, with additional thickness provided in larger flumes.

Maintenance Free
The Palmer Bowlius flume design of slightly raised floor and trapezoidal side walls offers minimum flow constriction. As a result, the flume is essentially a self-cleaning, maintenance-free device.

Principles of Operation
The Palmer Bowlius flume is a specially shaped channel, characterized by a raised floor and trapezoidal side walls in the throat section. The throat of the flume causes some backup of flow upstream of the throat section, with the level at this point being a function of the flowrate. Since the flume is designed to produce critical flow in its throat, it is essential that upstream flow be sub-critical (lower in velocity than in the throat of the flume) and non-turbulent. If turbulence occurs, corrective measures must be taken such that upstream flow is tranquil and uniformly parallel at the entrance to the flume. A small jump or rise in the water surface just below (downstream side) the throat of the flume is positive evidence that the required critical flow is occurring through the flume. This jump must not take place in the throat of the flume.

The flume must be installed in a level position, with the ideal measuring point a distance of one-half diameter upstream from the entrance to the flume.

Optional Features
The Manning Palmer Bowlius flumes are available with special features to meet your particular requirements.

End Bulkheads
For installing a Permanent Flume in a pipe whose diameter is larger than the flume diameter.

Ultrasonic Mounting Bracket - Integially mounted bracket with 1/4” NPT connection for convenient installation of a Manning Ultrasonic Transducer.

Typical installation of a Palmer Bowlius invert flume in a manhole.

PROFILE OF FLOW IN PALMER BOWLIUS FLUMES
SPECIFICATIONS

Palmer Bowlus Flumes:
There shall be furnished for installation in the pipeline channel, a fiberglass reinforced polyester Palmer Bowlus flume. The flume shall have a minimum wall thickness of 3/16" throughout, and smooth white gel coated inside surfaces. Integral spreader shall be included to assure dimensional stability.

(for Permanent Flumes)
The measuring flume shall be of one-piece design with an integral approach section. The entrance and exit ends shall be U-shaped, with the inside diameter (I.D.) the same as the I.D. of the pipeline in which it is installed. The flume shall have a diameter of _____ inches, and an overall length of _____ inches.

(for Oversize Pipelines)
The entrance and exit ends shall be supplied with end bulkheads suitable for use in a circular channel. The end bulkheads shall have a radius equal to the radius of the pipeline channel in which it is installed.

(for Invert or Exit Pipe Flumes)
The measuring flume shall be an invert (or exit pipe) type, suitable for installation in an existing half section of pipeline channel. The flume shall be of U-shape design with the outside diameter approximately equal to the inside diameter of the channel in which it is installed. The flume shall have a diameter of _____ inches, and an overall length of _____ inches.

(for Quick Insert Flumes)
The measuring flume shall be for portable usage. It shall include a measuring throat section and an integral round pipe discharge section with an inflatable rubber sealing ring. A leveling bracket and flashtye level shall be included to assure correct alignment.

The flume shall have an inside diameter of _____ inches and be capable of sealing to pipe sizes of _____ inches to _____ inches in diameter.

The flume shall be Manning Model PBF _____ or equal.

---

**Dimensions (inches)**

<table>
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<th>Max. Head (inches)</th>
<th>D/H Flumes R</th>
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*Note: For Permanent
1 for Invert
E for Exit Pipe
O for Quick Insert*
PARshall FLume

Field Proven
The Parshall flume is the most widely used primary device for open channel flow measurement in wastewater applications. Developed many years ago by Mr. R.L. Parshall under the auspices of the U.S. Department of Agriculture, this empirically rated measuring device has become a standard in the wastewater industry.

Accurate
The rating tables for the Parshall flume are based on empirical data accumulated through extensive and meticulous research and testing. As a result, this flume is capable of high accuracy over a wide range of flows.

With proper installation, it is almost always possible to achieve “free flow” conditions (downstream water level does not affect the upstream water level) in a Parshall flume. In free flow, only the upstream level (Ha) need be measured; and this condition is favored for accurate measurement.

Submerged flow may occur when the downstream water level (Hb) is high enough to affect the upstream level. In the Parshall flume, submerged flow may be expected when the ratio of the two levels, Hb/Ha, is greater than 0.6 for flumes with under a one foot throat and 0.7 for flumes with one foot throats or larger. When submergence does occur, two level measurements must be taken. (Ha and Hb) and corrections must be made.

Rugged
The fiberglass Parshall flume offers the same advantages of corrosion resistance, smooth surfaces, one-piece design, and dimensional integrity that are found in our Palmer Bowlius flumes.

Proper sizing and setting is necessary for successful operation. Frequently, the elevation of the crest of flume (the crest is the level floor of the converging section) is governed by the maximum allowable head. Where the crest of the flume is more than 6” above the channel bottom, a short upward sloping approach to the inlet of the flume should be provided. All flumes must be set with the converging (entrance) section level.

Optional Features
The Manning Parshall flumes are available with a variety of optional features to meet your particular requirements.

Short Section Flumes - When “free fall” conditions exist, the diverging (exit) section may be omitted without affecting the flume’s accuracy.

Integral Stilling Well - May be desirable to calm the water surface when heavy turbulence is experienced at the measuring point.

End Adaptors - When it is necessary to make the transition from a round pipe to the flume and back to round, standard end adaptors with caulking collars are available.

2-Inch NPT Connection - Available on either side of the flume for connection to a remote well or bubbler system.

Ultrasonic Mounting Bracket - Integrally mounted bracket with 1/4” NPT connection for convenient installation of a Manning Ultrasonic Transducer.

Principles of Operation
The channel shape of the Parshall flume consists of a converging (entrance) section, a throat section, and a diverging (exit) section. The throat contraction, combined with a drop in the floor of the flume, produces supercritical flow through the throat. As with the Palmer Bowlius, the upstream channel should be straight; with a low velocity of approach to the Parshall flume being desirable. This will help insure a non-turbulent, well distributed flow entering the flume.
SPECIFICATIONS

Parshall Flumes

There shall be furnished for installation in the flume channel, a full-length, molded fiberglass reinforced polyester Parshall flume liner with a throat width of _______ inches. The flume shall have a minimum wall thickness of _______ (3/16" for under 1 foot throat, 1/4" for 1 thru 8 foot throat sizes)

The flume shall include an indicating depth gauge, integral spreaders, and mounting clips.

The Parshall flume shall be a Manning Model PF—____ or equal.

**TABLE**

<table>
<thead>
<tr>
<th>Flume Model No.</th>
<th>throat Width W (in)</th>
<th>Max. Free Flow Discharge (gpm)</th>
<th>weight (lbs)</th>
<th>Dimensions</th>
<th>Shipping Weight (lbs)</th>
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</thead>
<tbody>
<tr>
<td>PF-1</td>
<td>1&quot;</td>
<td>172</td>
<td>1.1</td>
<td>7.95</td>
<td>1-1/16&quot;</td>
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<tr>
<td>PF-2</td>
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<td>200</td>
<td>1.8</td>
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<td>1-1/16&quot;</td>
</tr>
</tbody>
</table>

manning
PRODUCTS

1111 South State St., Champagn[e, IL 61821 - 778-564-8579

16
PRODUCTS*

- FLOW MEASUREMENT FLUMES
  - Parshall flumes
  - Palmer-Bowlus flumes
  - H-flumes
  - Cutthroat flumes
  - Trapezoidal flumes

- WASTEWATER TREATMENT PRODUCTS
  - Troughs
  - Launderns
  - Weirs and baffles
  - Stope plates and slide gates

- WEATHERPROOF SHELTERS
  - Instrument and equipment shelters
  - Chlorinator shelters
  - ISCO sampler shelters
  - Flow meter storm covers

- CORROSION RESISTANT PIPE HANGERS
  - Fiberglass
  - Stainless steel

- PACKAGED METERING MANHOLES

* Detailed brochures are available on request.

PACKAGED METERING MANHOLE

1. The Plasti-Fab, Inc. Packaged Metering Manhole structure incorporates the measuring flume, inlet and outlet adapters with rubber pipe connections, manhole barrel and hinged cover, or manway cone reducer for installations up to 20 feet deep.

FLOW MEASUREMENT FLUMES

Available in fiberglass or stainless steel construction
Plasti-Fab will provide special designed and customized flumes for your unique application
Plasti-Fab Flumes are available with flanged or sleeved end fittings for ease of installation

PARSHALL FLUMES

2. The Parshall flume with or without integral floatwell is the standard of the industry. Plasti-Fab has provided many variations of this flume, both in standard and special customized configurations.

3. Double flumes solve the problem of measuring low flows now and higher flows in the future. The inner flume, used for low flow measurement, can be removed when increased flow rates require the use of the large flume. The flume pictured was specially designed and fabricated so it could be disassembled and passed through a manhole and reassembled.
4. The double flume pictured has a removable inner flume. This solves the problem of measuring flow in applications that have large seasonal flow variations.

5. The measurement of flow in large pipes may require a small Parshall flume with wingwalls and bushheads for accurate flow measurement. Plasti-Fab can assist in proper flume selection and design.

6. End adapters for connection between Parshall flumes and pipelines makes installation easier and less expensive.

7. A typical Parshall-Bowlus flume. Plasti-Fab has supplied many variations of this flume. Note the built-in subbase pipe. This flume was built in sections so that it could be passed through a manhole opening.

8. A special design Parshall-Bowlus flume with a top extension to prevent additional water from overflowing or entering the flume. Also note the flanged end fitting which can reduce installation cost.

9. This Parshall-Bowlus flume was another special designed by Plasti-Fab. It was required to float to permit towing into place. The stainless steel locking mechanism was then forced against the roof of the pipe to hold the flume in place.

10. The basic stainless steel throat shape can be supplied for welding into metal pipelines.

11. A cutback Parshall-Bowlus (recommended only in small sizes). These are frequently used for I & I studies.

12. Plasti-Fab has provided Parshall-Bowlus flumes up to 8 feet in diameter. The one pictured was used in an industrial drain trench.
21. Fiberglass slide gates can be supplied with either non-metal or metal guide frames.
22. A typical slide gate installation. This fiberglass gate has galvanized steel head frames and FRP guide frames.
23. Fiberglass stop plates having sandwich core construction with fiberglass guide frame and hinged cast aluminum handles are becoming increasingly popular.
24. An example of Plasti-Fab’s design capability. This picture shows a pneumatically controlled gate on a flume.
25. Speciality gates with electric motor operators, such as this one built as part of a Parshall flume, can save considerable cost in field installation.
26. A wedge type slide gate with neoprene or natural rubber U-seals is utilized to provide tight shut-off.
27. This picture shows another air operated slide gate and illustrates the design variations available from Plasti-Fab. The frame on this gate was made from carpenter 20 alloy.

**WEATHERPROOF SHELTERS**

28. Plasti-Fab instrument and equipment shelters come complete with integral floor, optional lifting eyes and other accessories.
29. This storm cover for flow meters mounts directly onto integral bowlwells providing weather tight protection for flow meters.

**CORROSION RESISTANT PIPE HANGERS**

30. Plasti-Fab, Inc. manufactures a complete line of fiberglass and stainless steel pipe hangers up to 72 inches in diameter. These hangers are ideal for use in a salt water environment or in other corrosive atmospheres.
13. The H-Flume is gaining in popularity due to its ability to handle a wide range of flow variations. The unit pictured shows tranquilizing racks, energy absorber and intergate all designed and supplied by Plasti-Fab.

14. The cutthroat flume is relatively new to the industry. It is used when head conservation is a necessity.

15. The Trapezoidal flume is used for measuring very low flows. It is frequently used in open ditches. The unit pictured is equipped with a bubble pipe and end bulkheads for placement in a pipeline. It also can be supplied with a floatwell.

16. A typical wastewater treatment unit showing matched die-molded weir plates.

17. A square clarifier with effluent trough and adjustable weir gates. Plasti-Fab fiberglass troughs, weirs, and baffles are utilized in numerous wastewater treatment plants.

18. High quality filter backwash troughs have been supplied by Plasti-Fab for many years.

19. Plasti-Fab effluent troughs and matched die-molded weir plates are installed in this large water treatment plant in California.

20. Corrosion resistance with resulting low maintenance is an added advantage of matched die-molded fiberglass weirs.