D.2.2.2. Title Page

Columbia Irrigation District End of Canal System Automation & Measurement

Prepared by District Staff
17 March 2021

A View of Wanawish Dam

Columbia Irrigation District End of System Canal Automation Project proposal and related information for Grant application pursuant to: Notice of Funding Opportunity Announcement No. R21AS00300. Project Manager: Clancy Flynn, 10 E. Kennewick Ave Kennewick, WA 99336 (509)586-6118.

D.2.2.3. Table of Contents

D.2.2.4. Technical Proposal and Evaluation Criteria

The technical proposal and evaluation criteria (15 pages maximum) include:

(1) Executive summary
(2) Project location
(3) Project description
(4) Evaluation criteria

D2.2.4.1 Executive Summary

Date: 17 March 2021

Applicant Name: Columbia Irrigation District

City, County and State: Kennewick, Benton County, Washington

Applicant Category: A

Project Summary: Columbia Irrigation District (CID) located in south central Washington will add three automated sites to Laterals 1 and 2, a spillway on each lateral and an automated check gate at the end of Lateral 2, a magnetic flow meter for LID (Local Improvement District) #2 ("Soggie" LID) and an automated gate at Section 7 (the last 8.37 miles of the main canal aka Lateral 3). None of the District's facilities are federally owned, operated or connected to a federal reclamation project. The automated spillways are both located within the last third of their respective canal reaches; the 2.6-mile mark and the 5.4-mile mark for Laterals 1 and 2, respectively. Lateral 2 will also receive an automated gate at the last check structure on the lateral. The work at each of the three sites will involve reconfiguring the current canal structures, typically cutting old concrete and/or adding concrete to the existing structure to accommodate retrofitting of the new gates and relative controls/power units. The addition of these gates will automate the canal operations and provide valuable flow data. The automation of the canals will lead to greater safety, improved service, and a modest water savings of approximately 120 AF. Also, flow data is that collected from these features will add to the District's understanding of water usage patterns, water losing reaches and provides information to further District water saving efforts while allowing the tracking of water savings amounts realized. The District proposes to start construction and installation activities 1 February 2022 and complete installation activities on or before 20 March 2022.

D.2.2.4.2 Project Location

Provide detailed information on the proposed project location or project area including a map showing the geographic location. Laterals 1 and 2 Automation is in Benton County, Washington State within the incorporated portions of Kennewick; all project sites are southeast of and within 6.5 miles of downtown Kennewick.

D.2.2.4.3 Project Description

Provide a more comprehensive description of the technical aspects of your project, including the work to be accomplished and the approach to complete the work. This description should provide

detailed information about the project including materials and equipment and the work to be conducted to complete the project. This section provides an opportunity for the applicant to provide a clear description of the technical nature of the project and to address any aspect of the project that reviewers may need additional information to understand.

Sites: End of Lateral 2, Sands Wasteway, Cox Wasteway.

End of Lateral #2 Check

Lateral #1 Sands Wasteway

Lateral #2 Cox Wasteway

Each of the above sites will require the same general work but to varying extents for each step. The first objective at each site will be to cut the concrete of the existing board-slot check structure. This will be accomplished using the District's gas-powered concrete saw. The concrete will then be removed and disposed by District's crew using prybars, mini excavator, and dump truck. The site will be prepped with any fill and compaction thereof needed for the placement of the concrete structure to house the new gate. District crews will fabricate concrete forms out of plywood, 2x4's and snap ties for the placement of the concrete. The frame of the new automated check gate will then be affixed to the concrete using concrete anchor bolts drilled into the new structure and secured with adhesive. Any gaps between the frame and the structure will be filled with speed plug

concrete mortar. The solar panel will be set into the concrete pad and the gate will be installed in the frame. Lastly, with the help of a technician from the gate manufacturer the gate will be wired and calibrated. The gates to be used will likely be provided by Rubicon to match all the District's existing gates and make the SCADA system integration seamless.

Site: Section 7 Check

This site will require adding 13" inches of concrete to each of the existing walls to accommodate the size of the retrofitted gate. The current board-slot opening is 92" wide and the proposed gate is 65" wide. The process will then be same as the others in mounting the gate frame, installing the gate in the frame, mounting solar panel, and wiring/programming the unit.

Site: End of Lateral #1; LID #2 "Soggie LID" supplemental pump

This site will require cutting into the discharge pipe of the pump with torches, reciprocating saws, and chop saws. Welding flanges onto ends of the pipe with truck-mounted stick welder-generators, bolting the flow meter into place, then wiring the flow meter for power. The flow meter will be a magnetic model with a data logger that will be connected to the District's SCADA system for remote monitoring.

D.2.2.5. Project Budget

Funding Plan and Letters of Commitment

- Any monetary contributions by the applicant towards the cost-share requirement and source of funds (e.g., reserve account, tax revenue, and/or assessments). ***The monetary portion of the project costs will be covered out of the District's operating budget (may be augmented by reserve funds depending upon timing of award relative to the District budget cycle).***
- Any costs that will be contributed by the applicant. ***The remaining portion of the District's contributions will be in-kind in the form of using District personnel and equipment, as identified in the budget proposal.***
- Any third-party in-kind costs (i.e., goods and services provided by a third party). ***No other contributions toward the non-Federal portion of project costs are anticipated.***
- Any cash requested or received from other non-Federal entities. ***None.***
- Any pending funding requests (i.e., grants or loans) that have not yet been approved and explain how the project will be affected if such funding is denied. ***No other funding request are pending for the proposed project.***

In addition, please identify whether the budget proposal includes any project costs that have been or may be incurred prior to award. For each cost, describe:

The required Cultural survey of the project area is the only pre-award cost that is included in the budget proposal.

- The project expenditure and amount. ***The District anticipates this to cost $3,500.***
- The date of cost incurrence. ***This review will be done during the summer of 2021.***
- How the expenditure benefits the project. ***It will ensure that the project will not impact the historical context of the project area and meet the requirement for federal money to be used on the project.***

Budget Proposal

Table 1. —Total Project Cost Table

SOURCE	AMOUNT
Costs to be reimbursed with the requested Federal funding	$ 75,000.00
Costs to be paid by the applicant	$ 90,144.15
Value of third-party contributions	$ 0
TOTAL PROJECT COST	**$ 165,144.15**

Table 2. —Budget Proposal

BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	TOTAL COST
	$/Unit	Quantity		
Salaries and Wages				
Project Manager	$72.80	30	Hours	$ 2,184.00
Operations Lead	$51.73	20	Hours	$ 1,034.60
Technical Lead	$48.09	40	Hours	$1,923.60
Operator	$45.42	40	Hours	$1,816.80
Crew Member	$35.65	15	Hours	$534.75
Crew Member	$30.30	14	Hours	$424.20
Crew Member	$40.75	14	Hours	$570.50
Crew Member	$44.79	13	Hours	$582.27
Fringe Benefits				
Included in rates shown	**Labor Costs**			
Contractors				
Environmental Compliance	$7,500.00	1	Invoice	$ 7,500.00
CID EQUIPMENT				
318 Excavator	$74.68	15	Hours	$1,120.20
Mini Excavator	$22.40	6	Hours	$134.40
1-Ton Truck	$53.40	36	Hours	$1,922.40
½-Ton Truck	$34.95	30	Hours	$1,048.50
Truck Chassis & Dump Bed	$72.89	11	Hours	$801.79
Concrete saw	$3.19	10	Hours	$31.90
Supplies and Materials				
Gate (Sands Waste and End Lat #2)	$24,595	2	Units	$ 49,190.00
Gate Cox Wasteway	$24,490	1	Units	$24,490.00
Gate Section &	$36,670	1	Units	$36,670.00
Install Charges	$1,000	4	Units	$4,000.00
Level Tuning	$1,500	3	Units	$4,500.00
SCADA Service Agreement	$500	4	Units	$2,000.00
Supervision and Commissioning	$1,500	4	Units	$6,000.00
Flow Meter Soggie Pump	$3,000	1	Units	$3,000.00
Misc.	$1,500	1	N/A	$1,500.00
TOTAL DIRECT COSTS				**$ 152,979.91**
Indirect Costs				
Sales Tax	8.6%	$11,425.10		$11,425.10
Office Manager	$44.08	8	Hours	$352.64

Office Administrative Assistant	$38.65	10	Hours	$386.50
TOTAL ESTIMATED PROJECT COSTS				**$ 165,144.15**

Budget Narrative

Salaries and Wages

The Project Manager will be Clancy Flynn and the Supervisors will be Bob Ingraham and Curt Strifert. The certified current rates of pay for these individuals and for the crew are the rates listed in the budget proposal. These salaries are applied consistently to all Federal and Non-Federal activities of CID and are contractually set to increase 3% effective January 2022. The compliance hours for reporting are estimated at 8 for Admin/Clerical staff and 20 for the Project Manager that are included in the total hours for the Project Manager.

Fringe Benefits

These benefits are included in all the labor rates shown in Table 2. They include: The District's costs for health insurance, retirement, deferred compensation, vacation leave accruals, sick leave accruals, clothing allowances and employee taxes (FICA and Labor and Industries). The CID Fee Schedule, included as Appendix D, is evaluated, and set annually by the Board of Directors and applied to all District projects including grant work.

Travel

There is no travel authorized for this project nor included in the budget proposal.

Equipment

All equipment to be used on this project is owned by CID or will be purchased by CID. The equipment budget is therefore shown as in-kind contribution by CID as if it is owned by CID. The rates in the budget proposal are in accordance with the USACE equipment rates for region 8. The time estimate for each piece of equipment was determined from the average usage on similar past District projects.

Materials and Supplies

The materials and supplies listed in the budget proposal are all for construction efforts related to the gate site prep and installation. The costs for materials were estimated from budgetary quotes obtained from distributors and past District projects.

Other Expenses

The $1,500.00 listed as miscellaneous is for unforeseen expenses that might arise such as small electrical components, wire, freight, or small tools that might break.

Indirect Costs

The indirect cost represents WA state and local sales taxes and clerical staff time to prepare reports and track project expenses. The clerical staff hourly rate shown in the budget proposal include the fringe benefits.

Environmental and Regulatory Compliance Costs

The amount shown in these line items include an estimated cost for cultural review by a consultant and an amount anticipated to be expended by the USBR during its environmental review process.

Contractual

The only contractual expenditure that is anticipated will be for the consulting need for the cultural and environmental survey of the project area.

Third-Party In-Kind Contributions

The District does not anticipate any contributions matching this description.

D.2.2.6. Environmental and Cultural Resources Compliance

Please answer the questions from *Section H.1. Environmental and Cultural Resource Considerations* in this section.

- Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Please briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts. ***No, the project will not have any of these effects. There will be limited dust from concrete cutting in the initial phase and it is only projected to last for up to three hours per site for one day.***

- Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project? **The District is not aware of any such species in the project area.**

- Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as "Waters of the United States?" If so, please describe and estimate any impacts the proposed project may have. ***No.***

- When was the water delivery system constructed? ***1892-1893 with a major update in 1917.***

- Will the proposed project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications

to those features completed previously. ***The project will add automation apparatus to existing structures. The construction dates vary between 1917-1998.***

- Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question. ***Yes, the canal system itself is listed.***

- Are there any known archeological sites in the proposed project area? **No.**

- Will the proposed project have a disproportionately high and adverse effect on low income or minority populations? ***No.***

- Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands? ***No.***

- Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area? ***No.***

D.2.2.7. Required Permits or Approvals

There are no required permits because the work will be done within current District facilities and rights-of-way.

D.2.2.8. Official Resolution

COLUMBIA
IRRIGATION DISTRICT
10 E Kennewick Avenue, Kennewick, WA 99336
Office: (509) 586-6218
Fax: (509) 586-0485
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Laterals Automation
Resolution 2021-1

WHEREAS, the Columbia Irrigation District has begun implementation of a 10- year capital improvements plan; and
WHEREAS, the District recognizes the benefits that canal automation brings to operations including safety and water savings; and
WHEREAS, the Laterals 1 & 2 currently have no completed automation projects; and
WHREAS, Lateral 3 (AKA end of the Main Canal only has automation at the end; and
WHEREAS, said laterals provide service to an estimated 84% of the district irrigable acres; and
WHEREAS, by adding automation the District will protect the integrity of these canals and conserve water to ensure reliable service to these acres; and
WHEREAS, the Bureau of Reclamation has available WaterSmart grants to help with financing small-scale water efficiency projects.
NOW THEREFORE, BE IT RESOLVED that the Columbia Irrigation District authorizes a project to add automated gates to these laterals and a flow meter on the LID 2 supplemental pump.
BE IT FURTHER RESOLVED that the Columbia Irrigation District authorizes the pursuit of Reclamation WaterSmart, Small-Scale Water Efficiency monies to help cover the cost of said project.
BE IT FURTHER RESOLVED that Columbia Irrigation District is capable of and commits itself to providing the funds/in-kind contributions outlined in the grant application and to work with Reclamation to meet established deadlines for entering into a grant or cooperative agreement.

Dated this 5th day of March 2021.

COLUMBIA IRRIGATION DISTRICT

Vincent Shawver, President

Section E. Application Review Information

E.1. Technical Proposal: Evaluation Criteria

E.1.1. Evaluation Criterion A—Project Benefits

- Describe the expected benefits and outcomes of implementing the proposed project.

What are the benefits to the applicant's water supply delivery system? ***The end of the District canal system and appurtenant wasteways flow unknown quantities of water during the irrigation season. The quantification of these flows is a critical need of the District's water savings goals. If the quantity and timing of canal flows and wastes are not known, it is especially difficult to plan and prioritize water savings projects. Also, as the District continues to convert from rural to urban, timing water through the system is increasingly difficult with unknown quantities. The addition of these flow measuring, and water control devices will give the District flow information that is currently unavailable. With this information the District can better time the diversion and delivery of system water to minimize waste and plan future projects to improve service to patrons and save water.***

- If other benefits are expected explain those as well. Consider the following:

  - Extent to which the proposed project improves overall water supply reliability. ***This project will automate the end of every canal of the District's system. These reaches of canal carry water to roughly 83% of the District service area. The District will learn how to better manage water in these reaches to time the diversion of water from the head of the system to reduce waste and better deliver the water in a "just in time" manner. This differs from the current need to practice a "just in case" approach that keeps larger amounts of water flowing from the wasteways to ensure that a demand spike will not run the end dry. This distinction does not mean that the District will eliminate the practice of spilling water to meet demand. It means the information gathered will allow a reduction in the amounts of waste flowing at the wasteways because the District will know in real time flows and use that knowledge to***

make (eventually automate) the necessary changes to move the water "just in time" to the reaches of canal in need.

- The expected geographic scope benefits from the proposed project (e.g., local, sub-basin, basin). ***The benefits are expected to be geographically localized to the District and its patrons.***

- Extent to which the proposed project will increase collaboration and information sharing among water managers in the region. ***The project is expected to improve the District's data and thereby provide more data available for request for other stake holders in the region.***

- Any anticipated positive impacts/benefits to local sectors and economies (e.g., agriculture, environment, recreation, tourism). ***None are presently known to the District.***

  Extent to which the project will complement work done in coordination with NRCS in the area (e.g., with a direct connection to the district's water supply). Describe any on-farm efficiency work that is currently being completed or is anticipated to be completed in the future using NRCS assistance through EQIP or other programs. ***None are presently known to the District.***

E.1.2. Evaluation Criterion B—Planning Efforts Supporting the Project

- Does the proposed project implement a goal or address a need or problem identified in the existing planning effort? ***Yes, see Appendices A, B, & C.***

  - ***The gates at Cox Spillway and the end of Lateral 2 are specifically mentioned in the conservation plan but have never been implemented.***

  - ***The gate at Sands Wasteway will automate the waste at that location and is the first step towards the goal in the conservation plan of having a re-regulation reservoir at that location. With the eventual goal of the end of Lateral 1 to be a pressurized pipe delivery system operated out of the reservoir. The flow meter on the Soggie LID just before Lateral 1 tailwaters hit the USACE drain will allow for accurate measurement to that LID and give need information to the District in planning the proposed pressurized pipe system.***

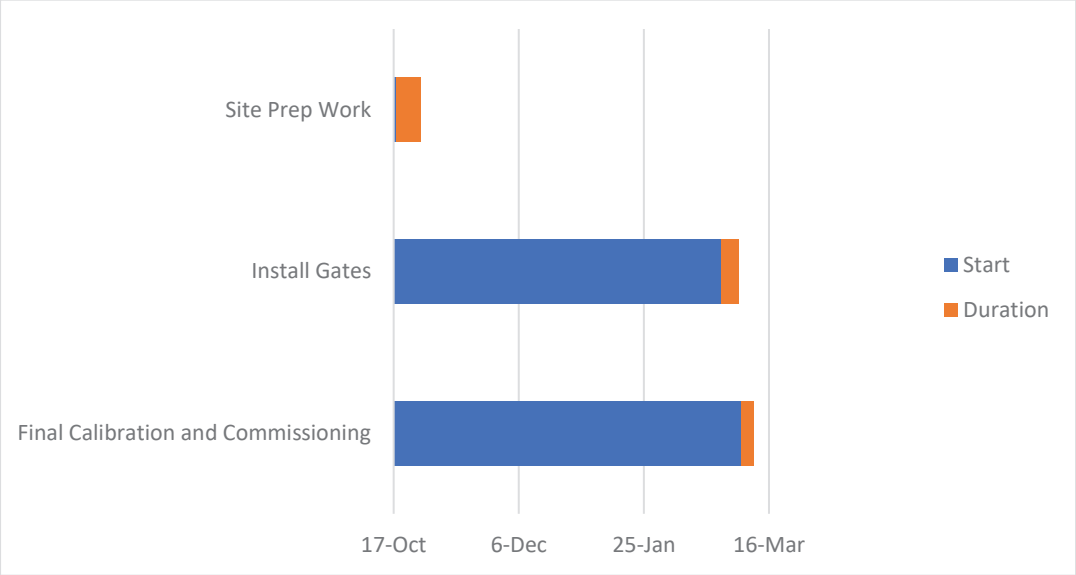
  - ***The gate at the Section 7 check structure will automate the end of the Main Canal (aka Lateral 3) and essentially provide further automation of the Divide (where the District system bifurcates in to Laterals 1,2 &3). The automation was planned for in the conservation plan but was only partially implemented.***

- Explain how the proposed project has been determined as a priority in the existing planning effort as opposed to other potential projects/measures. ***This project has been identified***

as a priority due to the information that can be collected for future planning and conservation efforts. It also provides increased operational capabilities that will provide better service and protection against canal failure.

E.1.3. Evaluation Criterion C—Project Implementation

- Describe the implementation plan for the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates.
  Implementation of this project will be done in three phases. The District will begin all necessary site prep and retrofitting 18 October 2021. This is estimated to take 8 workdays spread over 12 calendar days. The gates are anticipated to arrive approximately 18 February 2022. District crews will begin install of the gates on 22 February 2022 with technical assistance provided by the manufacturer and the District engineer, if needed. This will take 7 workdays spread over 9 calendar days. Also, we are allowing an additional 5 calendar days after install for any final fine-tuning calibration that might be needed. The gates will all retrofit to existing structure.



- Describe any permits that will be required, along with the process for obtaining such permits. ***No permits are required.***

- Identify and describe any engineering or design work performed specifically in support of the proposed project. ***The gates are fabricated off site and then installed in the retrofitted District facilities.***

- Describe any new policies or administrative actions required to implement the project. ***After the installation, the timing, measurement, and movement of water will be refined for operational efficiency.***

- Describe the timeline for completion of environmental and cultural resource compliance. Was the timeline for completion of environmental and cultural resource compliance discussed with the local Reclamation office? ***The cultural review for the project by the District contractor will be performed and completed by September 2021. The USBR cultural review process usually completes just prior to the notice to proceed. In the District's experience this portion is usually communicated to the District after the announcement of award.***

E.1.4. Evaluation Criterion D— Nexus to Reclamation

- Is the proposed project connected to a Reclamation project or activity? If so, how? Please consider the following:
    - Does the applicant receive Reclamation project water? ***No.***
    - Is the project on Reclamation project lands or involving Reclamation facilities?

      No.
    - Is the project in the same basin as a Reclamation project or activity? **Yes.**
    - Will the proposed work contribute water to a basin where a Reclamation project is located? ***Yes, saved water will potentially increase flows in the Yakima River. However, the District is the last major diverter on the Yakima rendering any saved water useless to other diverters. Saved water is anticipated to only benefit in-stream uses.***

- Will the project benefit any tribe(s)? ***Only to the extend that the potential saved water having a minor benefit to the Yakama Nation fisheries.***

Appendix A

CHAPTER 10
EVALUATION OPPORTUNITIES FOR IMPROVEMENTS

Eight water conservation projects will be evaluated in this chapter. The water conservation projects can be divided into four major group types:

I. Canal automation
II. Equalizing Reservoirs
III. Main canal and lateral canal piping
IV. Concrete lining of open channels

The primary concept behind the water conservation projects considered in this report is to conserve water by eliminating operational and physical losses within the system. The use of automatic control gates and equalizing reservoirs can reduce operational spills. By installing pipelines in open canals it is possible to eliminate operational spills, tailwater, and water loss due to seepage, vegetation, and evaporation. By lining canal sections it is possible to eliminate seepage losses as well as stabilize the canal structurally. Various sites and project alternatives have been considered which provide different levels of potential water savings. A summary of projects recommended for implementation is included in Chapter 11. The summary will compare the cost of each project by volume of water saved.

Canal Automation - Proposal 1

The main canal is already partially automated through the use of remote operated slide gates at the headworks and at Columbia Park spillway. Figure 10-1 shows the locations of proposed telemetry and canal automation sites. By updating existing telemetry systems and installing water level monitors, automated gates and new telemetry systems at key locations within the CID, it is possible to have direct access and control over major canal operation from within the CID office. Lateral No. 1 was dropped from consideration for canal automation control because it can more effectively be controlled through the use of an equalizing reservoir or as a closed piped system. If the CID decided to construct an

of liners were considered for initial cost and total annual life cycle costs (Table 10-2). The PVC 20 mil. liner system was selected as the option to be considered for final design because it has the lowest estimated annual life cycle cost.

TABLE 10-2

Liner Systems
Cost per square foot

Liner Description	Initial Cost (SF)	Average Liner Life (Years)	Annual Capitol Cost	Estimated Annual Maintenance Cost	Total Annual Life Cycle Cost
PVC: Soil Covered, 20 mil.	$0.35	25	$0.01	$0.00	$0.02
HDPE: Soil Covered, 40 mil.	$0.40	25	$0.02	$0.00	$0.02
HDPE: Exposed, 60 mil.	$0.40	25	$0.02	$0.01	$0.02
Bentonite Blanket	$0.60	15	$0.04	$0.02	$0.06
Bentonite	$0.50	20	$0.03	$0.01	$0.04

Equalizing Reservoir Design Considerations

Two areas within the current system have reported flow variations for which an equalizing reservoir can provide stabilization.. The first site is located at the Sandwaste spillway on Lateral No. 1. The second site is on the main canal between Columbia Park spillway and the Kennewick flume.

Typically the ideal location for an equalizing reservoir is in a natural depression or a canal switchback. A natural depression is the ideal site condition that can be found and utilized. But, a level site provides a very cost effective setting for reservoir development using a balanced cut and fill design. Sites located above the canal with water being pumped into the reservoir can also be considered.

Sandwaste Equalizing Reservoir - Proposal 2

Historically Lateral No. 1 has caused considerable problems for ditch riders trying to maintain operable water surface levels to diversion points on the lower end of the canal. With water depth varying from approximately 1.7 feet near the headworks to 0.4 feet near the Highland Drain, controlling flow over the 3.5 miles of canal can be very difficult. Currently,

excess water is diverted over a weir at the Sandwaste spillway and the Highland Drain spillway. At the Sandwaste spillway flow levels are currently controlled using a check structure fitted with a slidegate. By adjusting the slidegate, downstream flows can be increased or decreased to meet current demands. At the same time, the water surface elevations are being increased or decreased behind the check structure sending excess water over the Sandwaste weir or downstream through the slidegate. As water demands increase or decrease the ditch rider must currently adjust the Sandwaste check structure and the headworks diversion to balance both upper and lower sections of Lateral No. 1. Water flowing into the Sandwaste Spillway is lost from the system.

An equalizing reservoir can be used to recover water normally lost when it flows into the Sandwaste Spillway. Figure 10-5 shows the location for the proposed Sandwaste Reservoir. To provide adequate flow recovery from this reservoir, a storage capacity of at least 0.9 acre-feet is desirable. This capacity requirement was calculated by taking 20% of normal peak flow (in Lateral No. 1) over a 12 hour period. The 0.5 acre diversion site would be developed into an 8 foot deep, 80 x 80 foot storage reservoir with 3:1 side slopes. Automatic control gates linked through telemetry would control water surface elevations at the headworks and Sandwaste check structure. Inflow will be controlled over a weir into the reservoir and outflow will be pumped out through a 5-hp submersible pump capable of pumping 400 gpm back into the system. A detailed cost estimate for the Sandwaste equalizing reservoir is listed in Table 10-3. Estimated water savings by implementation of this proposal is 420 acre-feet/year.

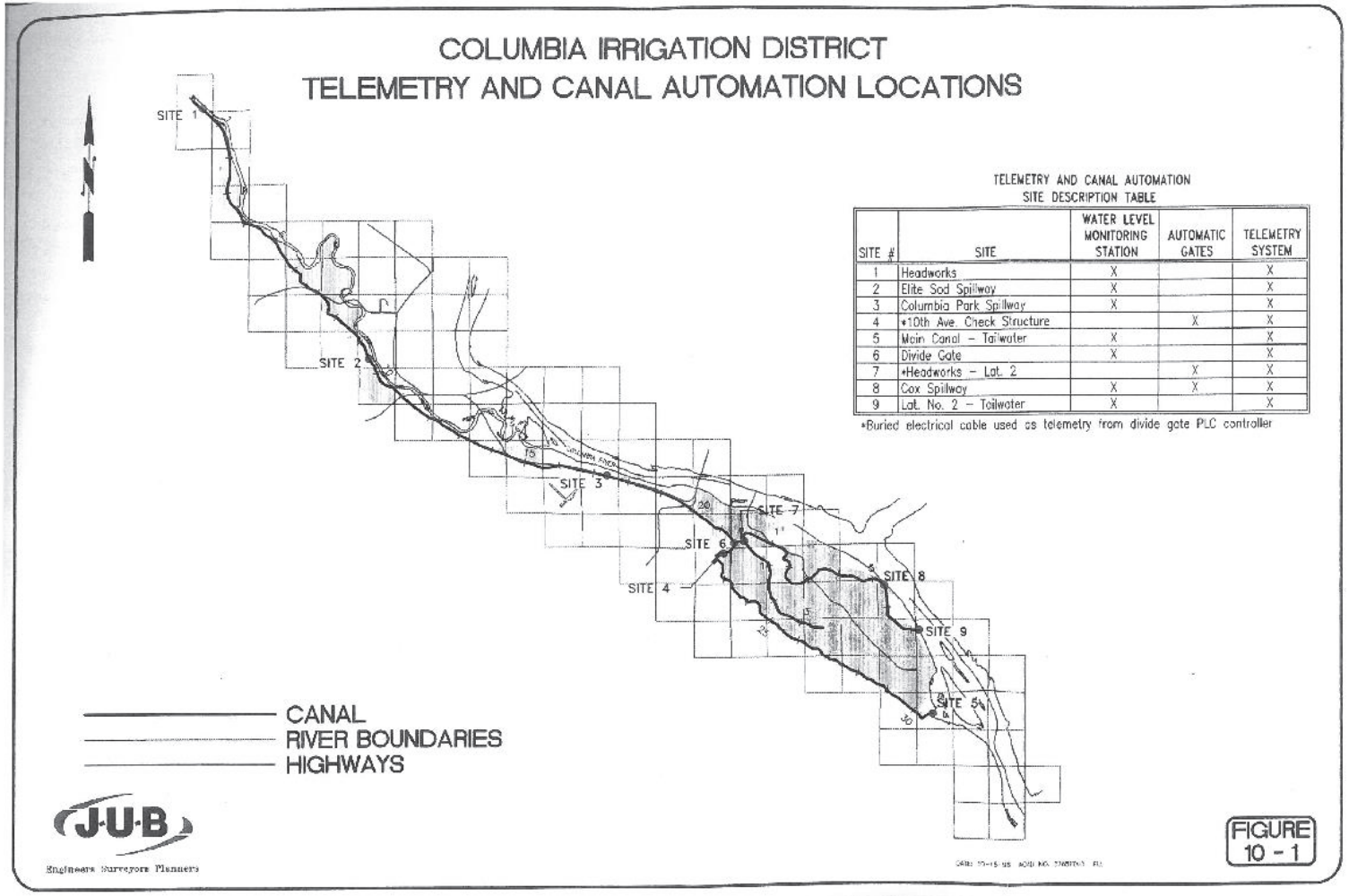
The construction of an equalizing reservoir at the Sandwaste Spillway would essentially eliminate the approximately 6,000 (±) square foot wetland associated with this spillway. On the National Wetlands Inventory Maps given in Appendix C, this wetland is labeled as POWFx (Palustrine, Open Water, Semipermanent, Excavated).

equalizing reservoir at the sand waste on Lateral No. 1, the headworks could be automated and linked directly to the operational controls shared by the reservoirs and the other automated canal systems.

Control structures proposed at the 10th Avenue check structure and Lateral No. 2 headworks would have one bay fitted with a fully automatic gate and the remaining bays equipped with manually operated gates. These structures will require adjustment of the manual gates at different times during the irrigation season to accommodate major flow demand changes but will eliminate the day to day adjustment typically needed in the system. Regulation of canal water surface is desired within a small variation. The automatic gate controlling upstream water surface, will operate to maintain a relatively constant water surface under varying flow conditions. The gate recommended for canal automatic operation is an underflow radial gate fitted with counterbalances or an automatic drop-leaf gate. The gate will be set to maintain a particular upstream water surface, which it can regulate closely over a limited range of flows. As flow demand in the canal changes, adjustments to the manual gates will be made and the automatic gate will maintain the required upstream water surface condition. Figure 10-2 shows a typical conceptual canal gate installation. Other existing gates at spillways and the headworks will be tied into the automatic system control. Level monitoring at key control points will be used as input to a system controller, which will then make control decisions and change positions of automated gates. A cost estimate for the proposed canal automation projects is listed in Table 10-1. Automation of the main canal must also consider that the Horn Rapids Diversion Dam will need to be rehabilitated or replaced in the near future. This future diversion dam work and the related cost must be included when considering project costs for this alternative.

Significant impacts on existing wetlands as a result of implementation of the proposed telemetry and canal automation projects are not anticipated. Some wetlands that are linked to the system spillways, such as at the Sandwaste Spillway, may experience reduced water flows. No other wetland impacts are foreseen for this proposal.

Appendix B



TELEMETRY AND CANAL AUTOMATION
SITE DESCRIPTION TABLE

SITE #	SITE	WATER LEVEL MONITORING STATION	AUTOMATIC GATES	TELEMETRY SYSTEM
1	Headworks	X		X
2	Elite Sod Spillway	X		X
3	Columbia Park Spillway	X		X
4	*10th Ave. Check Structure		X	X
5	Main Canal – Tailwater	X		X
6	Divide Gate	X		X
7	*Headworks – Lat. 2		X	X
8	Cox Spillway	X	X	X
9	Lat. No. 2 – Tailwater	X		X

*Buried electrical cable used as telemetry from divide gate PLC controller

Appendix C

Project Name:	Lat #1 2.7 mi re-reg (near Sands Waste)
Priority Ranking:	28.53
Project Type:	CIP
Useful Life:	30+
Department:	Field Ops

Project Description and Justification:

Adding a re-reg here is needed to meet the ebb and flow demands of our urbanizing system.

Expenditures	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
				199							199

Funding Sources	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
CID CIP Budget				100							100
CID Reserves											0
USBR				99							99
										Total	199

Operational Impact/Other Comments

This re-reg would regulate the flows throughout lateral #1.

Priority Ranking Criteria	Weighting Factor	Priority Factor	Score
Safety	1.50	1.33	2.00
Regulatory Mandate	1.50	0.67	1.01
Mission Statement Alignment	1.35	3.33	4.50
Conservation	1.25	2.67	3.34
Ongoing Operational Costs	1.00	1.67	1.67
Frequent Problems	1.25	2	2.50
Conservation Plan Alignment	1.05	2.67	2.80
Ability to Finance	1.00	2	2.00
Age or Condition of Existing	1.00	2.67	2.67
Cost of Project	1.00	1	1.00
Generates Savings or Revenue	1.50	2.67	4.01
Patron Demand	1.05	1	1.05
		Total	28.53

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Project Name:	Cox Spillway automation
Priority Ranking:	23.27
Project Type:	CIP
Useful Life:	15+
Department:	Field Ops

Project Description and Justification:

Install auto-gate at Cox Spill.
keep the water moving.

Expenditures	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
											0

Funding Sources	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
CID CIP Budget											0
CID Reserves											0
USBR											0
										Total	0

Operational Impact/Other Comments

Improved operational flexibility and canal saefty.

Priority Ranking Criteria	Weighting Factor	Priority Factor	Score
Safety	1.50	1.33	2.00
Regulatory Mandate	1.50	0	0.00
Mission Statement Alignment	1.35	2	2.70
Conservation	1.25	2.33	2.91
Ongoing Operational Costs	1.00	2.33	2.33
Frequent Problems	1.25	1.33	1.66
Conservation Plan Alignment	1.05	2.67	2.80
Ability to Finance	1.00	2.67	2.67
Age or Condition of Existing	1.00	1.67	1.67
Cost of Project	1.00	1.67	1.67
Generates Savings or Revenue	1.50	1.67	2.51
Patron Demand	1.05	0.33	0.35
		Total	23.27

Project Name:	Lower main auto gates
Priority Ranking:	28.53
Project Type:	CIP
Useful Life:	15+
Department:	Field Ops

Project Description and Justification:

Install auto-gate on lower main.

Expenditures	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
	137										0

Funding Sources	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
CID CIP Budget	137										137
CID Reserves											0
USBR											0
										Total	137

Operational Impact/Other Comments

Improved operational flexibility and canal safety.

Priority Ranking Criteria	Weighting Factor	Priority Factor	Score
Safety	1.50	1.33	2.00
Regulatory Mandate	1.50	0	0.00
Mission Statement Alignment	1.35	4	5.40
Conservation	1.25	3	3.75
Ongoing Operational Costs	1.00	2.33	2.33
Frequent Problems	1.25	3	3.75
Conservation Plan Alignment	1.05	3	3.15
Ability to Finance	1.00	4	4.00
Age or Condition of Existing	1.00	0	0.00
Cost of Project	1.00	1	1.00
Generates Savings or Revenue	1.50	0	0.00
Patron Demand	1.05	3	3.15
		Total	28.53

Project Name:	Soggie SCADA
Priority Ranking:	11.50
Project Type:	CIP
Useful Life:	10
Department:	Field Ops

Project Description and Justification:

Expenditures	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
											0

Funding Sources	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total
CID CIP Budget											0
CID Reserves											0
USBR											0
										Total	0

Operational Impact/Other Comments

Priority Ranking Criteria	Weighting Factor	Priority Factor	Score
Safety	1.50	1	1.50
Regulatory Mandate	1.50	0	0.00
Mission Statement Alignment	1.35	2	2.70
Conservation	1.25	1	1.25
Ongoing Operational Costs	1.00	0	0.00
Frequent Problems	1.25	0	0.00
Conservation Plan Alignment	1.05	1	1.05
Ability to Finance	1.00	4	4.00
Age or Condition of Existing	1.00	0	0.00
Cost of Project	1.00	1	1.00
Generates Savings or Revenue	1.50	0	0.00
Patron Demand	1.05	0	0.00
		Total	11.50

Appendix D

COLUMBIA
IRRIGATION DISTRICT

"Fee Schedule"

Effective Date: 7 June 2019 Revision: 2

APPROVED

Vince Shawver
President, Board of Directors

DATE: 7 June 2019

Review	Review	Review	Review	Review	Review
Date:	Date:	Date:	Date:	Date:	Date:
Initial:	Initial:	Initial:	Initial:	Initial:	Initial:

Administrative Fees	
Returned Check fee (NSF):	$35.00
Planning & Development	
Short Plats:	
Without irrigable acres or within private infrastructure areas	$100.00
With irrigable acres + engineering costs	$200.00
Field inspection	$150.00
Preliminary Plats:	
Without irrigable acres or within private infrastructure areas	$175.00
With irrigable acres + engineering costs	$500.00
Field Inspection	$250.00
Additional parcel over 25 lots	$20.00/lot
Final Plats:	
Without irrigable acres or within private infrastructure areas	$100.00
With irrigable acres + engineering costs	$175.00
Misc. (lot line adjustment, etc..):	$75.00
CID Standard Specification Packet:	$15.00
Irrigation Service:	
Service Change application	$200.00
Connection Admin. Fee	$125.00
Labor and Materials	Varies
Inspection Fee	$200.00
Service Restoration Fee	$250.00

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Construction Water Withdrawal	$100.00/day
Right-of-Way Use	
Encroachment permits:	
Application Fee	$20.00
Temporary Access *trespassing on right-of-way $250.00 fine per occurrence	$20.00 for each 3-day period of usage
Annually Renewed	$125.00/year
Long-term permanent	$700.00
*All Long-Term licenses may receive a prorated refund if encroachment is removed: $700 minus $125.00 for each year that the encroachment was in-place.	
Crossing CID Facilities:	
Aerial	$225.00
Buried Open Canal	$550.00
Buried Pipeline	$400.00
All engineering costs are extra	*Plus, all applicable ROW use permit fees*
Equipment	Per hour
2012 Ford F550	$61.38
2017 Chevy Silverado	$33.66
2012 Chevy Pickup	$33.66
2013 Chevy P/U 250	$34.52
1999 Clark Forklift	$23.3
2003 Peterbilt 385 Tanker	$72.89
2016 Chevy Silverado 1500	$33.66
2011 - Case 865 Motor Grader	$86.74
2018 - Chevrolet Silverado	$33.66
Saw	$3.19
Generator	$1.86
2020 Ford F350	$34.35
2019 Chevy Silverado 3500	$53.40
Case Loader 621D	$74.67
Mixer	$2.40
1997 Kenworth Dump Truck	$72.89
2016 Case 560SN Backhoe	$56.12
1983 185 GPQ Sullair Compressor	$9.77
Tilt Deck Trail-Eze Trailer	$4.14

1998 Case Backhoe	$56.12
1987 International Dump Truck	$72.89
2000 1-Ton Chevy w/dump	$33.23
2001 Chevy 1-Ton Spot Sprayer	$33.93
1996 Cat Trackhoe	$59.53
1999 Cat Backhoe	$56.12
Vacuum Trailer	$38.98
2004 Chevy C10 Pickup	$33.66
9020B Case Excavator	$74.68
2006 K10 Chevy Pickup	$34.95
Shop Welder	$0.46
1991 Volvo Semi	$72.89
Lowboy Equipment Trailer	$8.91
2019 14' Dump Trailer	$6.07
New Holland 5060 Tractor w/Mower	$41.88
1997 International Dump Truck	$72.89
2008 CX36B Case Excavator	$22.4
2007 Butler Flatbed Trailer	$2.55
2009 FORD F-150 4x4 (Burn Truck)	$34.95
2006 Case 240LR Excavator	$73.29
2010 K10 Chevy Pickup	$33.66
2006 850K Case Dozer	$55.00
2008 John Deere 5603 tractor w/mower	$41.88
2011 Ford F150 PICKUP	$33.66
2006 Sullair 375 Air Compressor	$24.67
2" trash pump	$1.23
Lincoln 250 Welder	$6.41
Wacker Packer Jumping Jack	$4.16
36" Chainsaw	$3.79
18" Chainsaw	$1.88
Personnel (including benefits and overhead)	
Operations Lead	$51.73
Technical Services Lead	$48.09
Operator	$45.42
Utility	$44.27
Ditchrider	$37.23
Laborer	$28.26

Appendix E

Columbia Irrigation District 2021
Wage Rates

3/17/2021

	BASE	FICA	L & I	RETIRE.	DEF COMP	VAC.	SICK	INS.	CLOTHING	TOTAL
DITCHRIDER	25.29	1.93	1.02	3.28	1.14	1.17	1.17	5.50	0.25	40.75
OT	37.94	2.90	1.02	4.92						46.78
OPERATIONS LEAD	32.75	2.51	1.02	4.25	1.11	2.83	1.51	5.50	0.25	51.73
OT	49.13	3.76	1.02	6.37						60.27
DITCHRIDER	18.67	1.43	1.02	2.42			0.86	5.38	0.25	30.03
OT	28.01	2.14	1.02	3.63						34.80
DITCHRIDER	20.52	1.57	1.02	2.66		0.95	0.95	5.50	0.25	33.42
OT	30.78	2.35	1.02	3.99						38.15
MAINTENANCE	29.76	2.28	1.02	3.86		1.37	1.37	5.50	0.25	45.42
OT	44.64	3.41	1.02	5.79						54.86
DITCHRIDER	22.24	1.70	1.02	2.88		1.03	1.03	5.50	0.25	35.65
OT	33.36	2.55	1.02	4.33						41.26
TECHNICAL LEAD	30.76	2.35	1.02	3.99	0.49	2.31	1.42	5.50	0.25	48.09
OT	46.14	3.53	1.02	5.98						56.67
DITCHRIDER	27.40	2.10	1.02	3.55	1.33	2.37	1.26	5.50	0.25	44.79
OT	41.10	3.14	1.02	5.33						50.59
UTILITY	28.25	2.16	1.02	3.66	0.00	2.12	1.30	5.50	0.25	44.27
OT	42.38	3.24	1.02	5.50						52.13
PROJECT MANAGER	47.77	3.65	0.11	6.20		2.20	2.20	10.66		72.80
OFFICE MANAGER	28.93	2.21	0.11	3.75	1.10	2.17	1.34	4.46		44.08
ADMIN ASSISTANT	23.54	1.80	0.11	3.05	0.17	1.77	1.09	7.12		38.65
TEMP	15.00	1.15	0.11							16.26

X:\02 - Payroll\Wages\Wage Rates 2021\Current Wage Rates with titles for Grant Applications Starting 03.01.21.xlsx

Appendix F

RUBICON

Rubicon Water

Fort Collins

Bozeman

Imperial

QUOTATION

Date: February 15, 2021

To: Clancy Flynn
Company: Columbia Irrigation District
Address: 10 East Kennewick Ave
Kennewick, WA 99336
Phone: 509-586-6118
cflynn@columbiairrigation.com

Project: Sands, End Lat 2, Cox, Section 7
Quote #: Q501298
Valid For: 60 days

Shipping terms: FOB Modesto, CA
Billing terms: Net 30 days [see Payment Terms for details]
Prepared by: Jill Carding
Jill.carding@rubiconwater.com

It is with pleasure the Rubicon Water submits this quote for the below sites within Columbia Irrigation District. We've listed our understanding of each site's goal, and given our recommended gate for each application, with any relevant application notes based on the knowns of the sites:

Sands Wasteway:
The primarily goals are to assist with overtopping issues and lack of freeboard by improved level control and accurate measurement. ***Concrete work will be required in order to fit the recommended gate.*** Our recommended gate is the **FGB-1050-0866** FlumeGate.

End Lateral 2:
The goal is to maintain upstream water levels, accurate measurement, and control overtopping. *Some concrete addition may be required depending on thickness of wall.* Our recommended gate is the **FGB-1050-0866** FlumeGate.

Cox Wasteway:
Remote control and accurate measurement are needed at the spill to the Columbia River, currently under manual control. ***Some concrete cutting may be required.*** Upstream level control is not thought to be required at this site as cfs is usually at 1cfs, but operates in a range of 1-20cfs. Our recommended gate is the **FGB-0760-1077** FlumeGate.

Section 7:
The primary needs are remote control and accurate measurement. ***Due to limited information we have based this on a 12" upstream/downstream water depth differential. (In event differential is greater, a smaller FlumeGate might be appropriate).*** Our recommended gate is the **FGB-1790-1587** FlumeGate.

Pricing is as below:

Qty	Product Number	Description	Each (US$)	Total (US$)
2	FGB-1060.0868	Rubicon FlumeGate, designed for nominal frame width of 3' and gate fully closed checking height of 36". Max fully submerged flow is 30 CFS, max freeflow is 42 CFS. Fully Integrated Solution	$24,595	$49,190
1	FGB-0780.1077	Rubicon FlumeGate, designed for nominal frame width of 3' and gate fully closed checking height of 40". Max fully submerged flow is 28 CFS, max freeflow is 36 CFS. Fully Integrated Solution	$24,490	$24,490
1	FGB-1790-1587	Rubicon FlumeGate, designed for nominal frame width of 6.5' and gate fully closed checking height of 60". Max fully submerged flow is 122 CFS, max freeflow is 191 CFS. Fully Integrated Solution	$38,670	$38,670
3	Level Tuning Analysis	Level Tuning Analysis (per pool)	$1,500	$4,500
4	Supervision & Commissioning	Supervision & Commissioning (per gate)	$1,500	$6,000
4	SCADAConnect Live	SCADAConnect Live - Installation (per gate)	$1,000	$4,000
4	SCADAConnect Live	SCADAConnect Live - Annual Fee (per gate)	$500	$2,000
		Total *		**$126,850**

*Excluding taxes

FlumeGate Description:

The FlumeGate includes the following items:

- One aluminum FlumeGate*. Each gate comes as a complete turnkey installation, equipped with a control pedestal which includes a standard processor and keypad for automation, solar panel power system and a 16 ft mast for mounting of a communication antenna;
- One aluminum external mounting frame, c/w stainless steel anchors, Hilti epoxy and SIKA sealant;
- One (or more) 12-volt DC deep cycling battery pack. Each pack consists of two or more batteries. Note: the batteries must be removed from the meter and charged if the gates are not installed within four
- weeks of delivery;
- One set of primary ultrasonic water level sensors (long range);
- Standard Rubicon local flow software.

SCADAConnect Live Description:
Rubicon's Optional SCADAConnect Live is a cloud-based SCADA system that gives users full remote control of their sites via any web-enabled device, such as smartphone, tablet or computer.

- Data is transmitted through AT&T's cellular network to both send commands to the sites as well as gather all data, including flows, levels, alarms etc. Included in SCADAConnect Live:
  - Full remote monitoring and control of sites. Note access can be varied depending on password for different representatives of the subscribing entity (full control versus monitoring only).
  - Alarming functions can be sent through email or text.
  - All data pertinent to each site can be viewed on the site's historian, or downloaded in .CSV format for storage or reporting.

Installation Labor:

Installation labor is priced at USD $1,500 per gate (included above)

Services during installation include:

- Site visits by a Rubicon certified Field Technician. The visits will involve supervising the lifting of the meter into the frame, installation of pedestal, wiring of monitoring pedestal to meter, commissioning and training in the operation and maintenance of the meter.

Exclusions:

- Civil works to structures to fit above meters.
- Concrete pad for meter pedestal.
- Supply and operation of crane for install of meter.
- Dewatering of site for installation:
  - It is expected that the site will be dry and clean for installation of external frames. If the Rubicon Technician finds that there is water on the site the day of the scheduled external frame installation, the client will pay for the additional day of labor lost.

Payment Terms:

Payments are to be made as follows:

- Net 30 days.
- Spare parts will be invoiced 100% when shipped.
- In the event that frames and meter/gate hardware are shipped separately, payment is to be made as follows:
  - 30% of the total price within 30 days of shipment of frames.
  - 70% of the total price within 30 days of the delivery of the meter/gate hardware.

All payments are to be made by check to Rubicon Systems America Inc.

Warranty

Rubicon Water warrants the hardware offered in this quotation to be free of defects in material and workmanship for a period of twelve months from the date of commissioning.

Warranty on spare parts is twelve months from delivery. Rubicon Water Standard Terms of Sale applies to this Quotation and is appended to the end of this quotation.

Delivery

All hardware will be delivered by road transport to customer worksite, whereupon immediate unloading will be the responsibility of customer. Rubicon will not be responsible for any damage that may occur at customer worksite.

It is anticipated the gates and associated hardware will be delivered to customer within 16-18 weeks upon receipt of a Purchase Order but will be confirmed by email once the order has been received. However, lead times may vary; your sales person can give you an updated lead time upon the submission of your order.

The Next Step:

To accept this quotation and begin the procurement process, please sign here and return:

Customer:

Authorised Signature Date

Authorized By:

North American General Manager

RUBICON WATER
STANDARD TERMS AND CONDITIONS

1. APPLICATION OF TERMS AND CONDITIONS
Unless otherwise agreed in writing, these terms will apply to the provision of all Products, Software and Services within the USA by Rubicon Systems America Inc of 7011 Argay Avenue, Suite 101, Fort Collins, Colorado 80524. Any terms and conditions contained in your purchase order or otherwise notified to us will apply only if they are specifically accepted in writing by us.

2. ORDERS
(a) Purchase orders, including agreement to our quotations, are to be submitted in writing and are subject to our final acceptance. Subject to (b) below, purchase orders will be deemed accepted when we receive them unless we advise you otherwise in writing.
(b) Written quotations of prices payable by you for the Products, Software and/or Services (Prices), will remain valid for 60 days and after that will be subject to our revalidation.

3. PRODUCTS
(a) Unless otherwise specified in writing, we warrant that for a period of 12 MONTHS from the date of commissioning (Product Warranty Period) all Products of our own manufacture will conform to our applicable design specifications.
(b) It is your responsibility to ensure that the Products you order are fit for your intended purpose.
(c) We reserve the right to replace Products with new or alternative Products with similar functionality.

4 SOFTWARE
(a) Unless otherwise specified in writing, we warrant that for a period of 12 MONTHS from the date of delivery (Software Warranty Period) all Software of our own manufacture will substantially perform in accordance with our functional specifications. This does not mean that we warrant that the Software will be error or bug free.
(b) We grant you a revocable, non-exclusive, non-transferable license to use the Software in conjunction with our Products subject to any restrictions we specify in writing. This license is subject to revocation upon any breach by you of these Standard Terms and Conditions or the termination of any contract between Rubicon and you. You may use the Software for the operations or applications for which it was furnished by us, but not for any other purpose without our prior written consent. You may not use of the Software in violation of any other restriction contained in these Standard Terms and Conditions, or after termination of the License.
(c) You acknowledge that ownership in the Software does not pass to you and your rights are limited to the conditions specified in these terms.
(d) You may use and copy the Software as is reasonably required for backup, maintenance or training purposes but otherwise the Software is not to be copied or altered without our prior consent. All copies of the Software must bear our original copyright and other proprietary notices, and shall remain property of Rubicon. You may not permit any third party to use or make copies of the Software.
(e) You will not reverse assemble or reverse compile the Software in whole or part. Only Rubicon may alter, enhance or modify the Software. All rights to any idea, process, discovery, enhancement or improvement arising from your use of the Software shall automatically become the sole property of Rubicon and shall be deemed to have been assigned to Rubicon in consideration for Rubicon's provision of the Software.
(f) Without our prior written consent, which may be withheld in our sole discretion, you may not: (i) sell, assign or otherwise transfer in any manner to any third party any rights in or to the Software; (ii) allow any 3rd party to use the Software; or (iii) sublicense, publish, display, distribute, or otherwise transfer to a third party the Software or any copy in whole or in part.

5. SERVICES
(a) We warrant that for a period of 12 MONTHS from the date they are performed (Services Warranty Period), all Services will be provided by us with due expedition and consistent with the required industry standards of professional skills and advice required for carrying out such Services.
(b) We will act professionally at all times and exercise skill, care and diligence in performing the Services.

6. OUR OBLIGATIONS
(a) In providing the Products, Software and/or Services, we will:
(i) act in a skilful, diligent, workmanlike, careful, safe and proper manner;
(ii) keep you appropriately informed of the progress of the provision of the Products, Software and/or Services;
(iii) act in accordance with standards and practices normally exercised in the water industry;
(iv) be entitled to exercise our judgment and use our skills as we consider most appropriate;
(v) complete the provision of Products, Software and/or Services in a timely manner.
(b) If we are delayed or we become aware of the likelihood of a delay in the provision of the Products, Software and/or Services, we will notify you as soon as possible after becoming aware of those circumstances.

7. YOUR OBLIGATIONS
In engaging us, you will:
(a) provide us with all relevant information necessary for the provision of the Products, Software and/or Services including site information, technical environment, relevant data, intelligence and instructions on an ongoing and timely basis as may be necessary and prudent;
(b) provide us with access to your personnel, premises, systems, facilities, confidential information, and/or records to enable us to provide the Products, Software and/or Services;
(c) acknowledge that if you do not meet these obligations you may cause or contribute to an increase in our estimated fees, we may incur additional costs, charges and expenses; and there is likely to be delays in the completion or the supply of the Products, Software and/or Services.
(d) not be obliged to disclose information that is not reasonably relevant.

8. WARRANTY
(a) Products, Software and/or Services not manufactured by us are excluded from our Warranty but we will seek to extend to you any warranty received from the original manufacturer or supplier so far as we are permitted to do so.
(b) In the event of a defect, malfunction or failure to conform to specification during the applicable Warranty Period we will, as determined by us:
(i) repair or replace defective Products;
(ii) replace or correct all reproducible defects, faults and errors in Software manufactured by us which fail as a direct result of our defective materials or workmanship;
(iii) re-perform the Services; or
(iv) refund the Price for such defective Products, Software or Services.
(c) Product warranty repair is provided at our facility and Software warranty is provided online. You will pay the return transport costs for sending the Products for repair. Where warranty repairs are required to be undertaken on site, you will pay all costs incurred by us other than the cost of actually undertaking the repairs. In the event that the defects are due to causes outside our warranty obligation, you will pay for the cost of repair or replacement, at our then current charges.
(d) Product and Software warranties will not apply to any Products or Software other than in their original condition which we determine have not been subjected to operating or environmental conditions in excess of the their maximum limits, or otherwise have not been subjected to misuse, improper installation, repair, alteration, or accidental damage, whether or not caused by you.
(e) EXCEPT FOR THE LIMITED WARRANTIES SET FORTH IN THESE STANDARD TERMS AND CONDITIONS, ALL PRODUCTS, SOFTWARE AND SERVICES ARE PROVIDED "AS IS". THESE LIMITED WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. We shall not be liable to you, or any user of any Products, Software or Services for any indirect, special, incidental, exemplary or consequential damages (including, without limitation, lost profits) related to these Standard Terms and Conditions or resulting from use or inability to use

RUBICON WATER
STANDARD TERMS AND CONDITIONS

the Products, Software or Services, arising from any cause of action whatsoever, including contract, warranty, strict liability, or negligence, even if we have been notified of the possibility of such damages. Under no circumstances shall our liability to you or any user of the Products, Software or Services exceed the amounts paid to us by you for the Product, Software or Service involved. No action under the foregoing limited warranties or these Standard Terms and Conditions may be brought more than one (1) year after the cause of action arises. Exclusive subject matter and personal jurisdiction for all disputes arising under this Agreement shall be the Larimer County District Court in Fort Collins, Colorado.

(f) You warrant that you have not relied on any representation, description, illustration, specification or any other material which has not been expressly published by us or agreed by us in writing.

(g) You warrant that the information you need to provide to us will be sufficiently comprehensive to enable us to meet our obligations and will be free from errors and omissions.

(h) Please note that whilst we warrant that all Products of our own manufacture will conform to our applicable design specifications for a period of 12 MONTHS from the date of shipment, unless you engage our services to evaluate your needs and accept our written recommendations it is your responsibility to ensure that the Products you order are correctly sized and fit for your intended purpose.

9 SOFTWARE MAINTENANCE AND SUPPORT SERVICES

(a) From the time of installation, we will provide you with your desired level of Software maintenance and support services.

(b) Software maintenance and support services do not include services involving correction of faults, errors or defects caused by:

(i) operation of the Software in a manner which contravenes your obligations;

(ii) failure by you to operate the Software in accordance with the relevant specifications which have been made known by us to you;

(iii) use of the Software in an environment other than that provided for in the relevant specifications;

(iv) Product maintenance performed by a person other than us or persons approved by us;

(v) modifications to the Software made by you or a third party, unless authorized by us.

(c) A condition of the provision of Software maintenance and support is that you must purchase the Software maintenance and support on a continuous basis from the time of installation. In the event that there is any period during which we do not provide Software maintenance and support, as a condition precedent to us undertaking any future Software maintenance and support we reserve the right to undertake at your expense an investigation of the Software and provide any required remedial maintenance to bring the Software to an acceptable level.

10 PRICES

(a) In consideration of the provision of the Products, Software and/or Services, You will pay the applicable Prices and at the times specified in our quotations or as specified in our published Price lists.

(b) We reserve the right:

(i) without liability or compact, to correct any errors or omissions in any offer, quotation, order confirmation, invoice or other documentation issued by us;

(ii) to pass on to you any additional costs (including merchant fees) incurred by us where you pay us by credit card;

(iii) to adjust the Prices to cover any exchange rate variations on imports and variations in labor and material costs to the date of invoice. We will reimburse to you any cost or benefit of variations incurred by us.

(c) All Prices are specified in US dollars.

11 TAXES

Unless expressly stated by us, Prices quoted or agreed do not include sales, goods and services, value added or any other applicable government tax or duty payable either before or after invoice from us. Such taxes and duties are payable in addition to the Prices.

12 PAYMENT

(a) We may invoice you for Products, Software and/or Services and all other amounts payable by you under these terms and conditions at any time after we notify you that the Products, Software and/or Services are ready for collection or we otherwise deliver or attempt to deliver the Products, Software and/or Services.

(b) Unless otherwise agreed and subject to you maintaining an acceptable credit rating, you must pay all invoices within 30 days of the date of the invoice.

(c) If you dispute an invoice you must (except in the case of non delivery) nonetheless pay the entire amount. We will refund any agreed amount following resolution of the dispute. If you fail to pay any invoice by the due date then, without affecting any other right or remedy available to us, we may:

(i) Suspend any further deliveries to you of the Products or Software in question or any other Products or Software and suspend or refuse to perform any Services to you whether under an existing or new order.

(ii) Charge you interest on the amount unpaid at the rate 5% above our then current overdraft rate until payment in full is made. Such interest is to be compounded daily.

(iii) Exercise a general lien over all of your property in our possession to cover the amount unpaid for the Products, Software and/or Services, and

(iv) Recover from you, in addition to the outstanding amount, all reasonable costs incurred by us in collection of the outstanding amount.

13 DELIVERY TITLE AND RISK

(a) Delivery schedules are estimates only and are subject to adjustment at any time. We will notify you of any changes in our delivery schedule but will not be liable for any additional costs that you may incur.

(b) All Products will be delivered in our standard packaging and will be accepted by you at the time of delivery.

(c) Property and risk in relation to the Products passes to you at the point of delivery to your carrier at our facility or, if you request us to arrange delivery and insurance, upon delivery to you.

(d) Title to the Products passes to you upon the earlier of payment in full for those Products or upon integration of the Products so that they are no longer capable of repossession.

(e) Until Title passes, we may repossess any Products for which payment has not been made in full by the due date.

14 CONFIDENTIALITY

(a) You agree not to disclose any information provided by us to you relating to us and our related entities that we may reasonably regard as confidential or commercially sensitive (including without limitation our pricing information) unless you can establish the information was:

(i) at the time of disclosure, in the public domain;

(ii) subsequent to disclosure, entered into the public domain other than through the breach of a duty owed to us; or

(iii) required to be disclosed by law.

(b) We will use reasonable endeavours to preserve the confidentiality of information supplied to us by you that you designate as confidential information. Nothing in these terms and conditions will impose on us the obligation not to disclose or use information already known to us prior to its disclosure to us by you, or lawfully received by us from a third party, or information published at the time of such disclosure, or information which enters the public domain through no fault of our own, or is required to be disclosed by law.

15 INTELLECTUAL PROPERTY RIGHTS

(a) Intellectual Property Rights includes copyright, trade mark, design, patent, semiconductor or circuit layout rights, know how, trade or other proprietary rights, or any rights to registration of such rights or protected by statute.

(b) You will retain ownership of any pre-existing Intellectual Property Rights in materials provided by you to us for use by us for the purposes of providing Products, Software and/or Services.

We will retain ownership of any pre-existing Intellectual Property Rights in materials, information, tools and methodologies provided by us to the purposes of providing the Products, Software and/or Services (or undertaking any improvements to the Products, Software and/or Services).

RUBICON WATER
STANDARD TERMS AND CONDITIONS

(c) You indemnify us against any claims of infringement of any Intellectual Property Rights or misuse of a third party's Confidential Information brought against us as a result of the provision of Products, Software and/or Services in relation to this contract or arising directly or indirectly from the use of any materials or information provided to us by you.

16 EXCLUSIONS AND LIMITATIONS

(a) We exclude all implied conditions and warranties except any implied condition or warranty that the exclusion of which would contravene any law, statute or cause any part of this paragraph to be void.

(b) To the extent permitted by law:

(i) we exclude liability (including from our breach of any express or implied condition or warranty or our negligence) for loss of profits or consequential or indirect loss or damage; and

(ii) our liability to you from our breach of any express or implied condition or warranty or our negligence is limited, at our option, to supplying the Products, Software and/or Services in respect of which the breach or negligence occurred again; or to paying the cost of having those Products Software and/or Services supplied again; or refunding the Price for the Products, Software and/or Services.

17 FORCE MAJEURE

We will not be liable for any failure to perform or delay in performance of any obligation where such failure or delay is due to anything beyond our reasonable control, including but not limited to adverse weather conditions, strikes, lockouts and other industrial action, material shortages, failure of any of our suppliers to supply, accidents, power failure, breakdowns of plant or machinery or import or export regulations or embargoes.

18 LIABILITY

Except as expressly stated in these terms and conditions, we will not be liable in contract or otherwise for any loss, damage, expense or injury of any sort whatsoever, consequential, indirect or otherwise, arising out of or in connection with the installation, use or failure of the Products, Software and/or Services sold or any defect in them or from any other cause.

19 TERMINATION

(a) We may, without affecting any other rights we may have, terminate or suspend any contract between us with immediate effect by giving notice to you if:

(i) you breach any provision of our contract and fail to remedy the breach within 7 days after us having notified you to do so;

(ii) if you breach a material provision of our contract where that breach is not capable of remedy;

(iii) you cease to be able to pay your debts as they become due;

(iv) you become subject to any form of insolvency or bankruptcy action that is not dismissed within 60 days; or

(v) any step is taken by a receiver or mortgagee to take possession or dispose of the whole or any part of your assets.

(b) If we exercise our rights to terminate or suspend a contract, we will immediately be entitled to invoice you for work in progress at our current rates. This paragraph does not limit or affect any other remedy which may be available to us including seeking compensation for any loss or damage suffered by us.

(c) If we are unable to perform or complete performance of our obligations wholly or in part due to causes beyond our control, we may unilaterally rescind the contract, or the outstanding portion, without any further liability to any party other than the obligation for you to pay for Products, Software and/or Services provided to the time of such termination.

20 SEVERENCE

If part or all of any provision of these terms and conditions or its application to any person or circumstance is illegal or unenforceable the provision will be interpreted so as to ensure it is not illegal or unenforceable. If any provision or part of it cannot be so interpreted the provision or part of it will be severed from these terms and conditions and the remaining provisions of these terms and conditions continue in force.

21 GOVERNING LAW

These Standard Terms and Conditions and all contracts between us will be governed by and interpreted according to the laws of the State of Colorado without regard to conflicts of laws provisions.

22 DISPUTE RESOLUTION; ENFORCEMENT

In the event of any dispute arising between us who are unable to be resolved by negotiation, the matter will be exclusive subject matter and personal jurisdiction shall be the Larimer County District Court in Fort Collins, Colorado. In any such proceeding, the prevailing party shall be entitled to recover from the other party, in addition to any other relief granted, all costs reasonably incurred by the prevailing party in the processing, including court costs, witness fees and reasonable attorney's fees.

If you violate any license granted by us or violate or infringe upon any of our intellectual property or other proprietary rights, we may institute proceedings either at law or in equity to obtain damages or equitable relief to enforce our rights. You acknowledge that monetary damages would not be a sufficient remedy for a breach of a license or violation of our intellectual property or other proprietary rights, and that we shall not be required to prove the inadequacy or insufficiency of monetary damages as a remedy in order to obtain equitable relief. No bond or other form of security shall be required in connection with any such injunctive or other equitable relief.

23 RUBICON AGENTS

i. Our sales agents are only authorized to promote the sale of our Products, Software and/or Services in accordance with our published specifications or variations thereto that we have approved in writing.

ii. We cannot take responsibility for any representation made by our sales agents that has not been published or authorized by us.

iii. Our sales agents are expected to comply with all applicable laws, regulations, codes of ethical conduct and where applicable government purchasing requirements and are instructed not to engage in any unethical conduct, payment of kickbacks or gratuities, or provision of any inappropriate benefits.

24 ENTIRE AGREEMENT AND VARIATIONS

(a) Any variation to these terms will only be effective if in writing and signed by both parties.

(b) You may, with our prior approval and subject to agreement for an adjustment of Prices, by written order make changes in accordance with the general scope of the contract to the drawings, designs or specifications or method of delivery or packing.

(c) In the case of such changes there will be an equitable adjustment to the Prices, delivery schedule and any other provisions of the contract affected by the changes.

(d) Unless otherwise agreed, all works will be suspended pending agreement on any adjustments to be made resulting from such changes.

FlumeGate®

RUBICON

Overview

The FlumeGate is a combined flow measurement and control gate designed for open canal applications. Accurate flow measurement, precise motor control, power supply and radio telecommunications are fully integrated in a single device.

In free-flow or submerged conditions, flow is calculated from the gate's own measurements of upstream water level, downstream water level and gate position. The FlumeGate can be operated as a stand-alone unit, or can coordinate with other gates along the canal to optimize the whole network's flow. It can be managed and monitored on-site or operated remotely when connected to a SCADA network.

The FlumeGate automatically controls the flow of water by varying the gate position based on a desired set-point or on irrigation demand as shown in the table:

Control objective		Gate action
Local	Position	Moves to a desired set-point and stays there
	Flow	Maintains a constant flow regardless of upstream or downstream loads
	Upstream level	Maintains a desired level in the pool immediately upstream
	Downstream level	Maintains a desired level in the pool immediately downstream
Network*	Demand	Changes the flow to match measured outflow from the network below the pool while maintaining a stable downstream water level
	Supply	Changes the flow to match the flow supplied from the network above the gate while maintaining a stable upstream water level

* Network control is only available when used with other Rubicon gates and Rubicon's suite of network control software.

A TCC® product

The FlumeGate is one of the products making up a modular family of precision hardware and software called TCC (Total Channel Control®). TCC is an advanced technology set designed to improve the management and productivity of water in open canal and gravity pipeline distribution. Unlike traditional infrastructure, TCC products can interact and work together to help managers improve:

- water availability
- service and equity to users
- management and control
- canal operator safety

Features

- Ultrasonic water level measurement
- Integrated flow calculation and control software
- Solar-charged or 120V AC charged battery system
- SCADA ready communication system
- Robust high duty cycle operation
- Overshot design for better water level control
- Optional walkways with handrails for staff safety

Ideal solution for ...

- Headgates, turnouts, or check structures requiring low headloss
- Gate modernization projects (more cost-effective than automating an existing gate)
- Remote locations without AC power
- Maintaining canal diversions or upstream water levels
- Measuring flow in canal-to-siphon applications

Data Sheet

FlumeGate®

Control Pedestal

Each FlumeGate installation includes a robust pedestal that provides power and control to the gate and a vandal-, weather-proof housing for electronic components and batteries.

The pedestal also serves as a local user interface. A keypad and LCD display are housed under a lockable lid allowing secure access for authorised users to monitor, control and troubleshoot on-site.

High strength construction

FormPanel™ by Rubicon is high strength gate leaf construction that uses techniques adopted from the aerospace and marine industries.

The gate panel assembly is a laminate construction that utilises high strength industrial adhesives to bond structural grade aluminium extrusions and skin plates to a synthetic core material. The result is strong, lightweight and corrosion resistant.

Flow measurement

The FlumeGate calculates flow using measurements of upstream water level, downstream water level and gate position, achieving rated or directly verified measurement accuracy of ±2.5%. This accuracy is attributed to its unique design and precision manufacture.

Rubicon MicroLevel® water level measurement sensors are housed within the internal frame. A water-tight seal separates the upstream and downstream sensors.

- Unique, integrated stilling well is unaffected by surrounding objects, debris, foam, silt or other contaminants
- Self-calibrates on every reading, to eliminate drift in speed of sound variations due to changes in temperature or humidity
- Specially designed for use in harsh irrigation canal environments

Local user interface

FormPanel™ construction

SolarDrive® electronics

Gate control technology

CableDrive™ is Rubicon's actuation system designed to provide precise gate position accuracy and repeatability in harsh environments. The drive is a wire rope (cable) and drum mechanism that provides positive drive in both the raise and lower directions. It is designed for high duty cycle operation and provides precise gate positioning to within ±0.5mm (±0.02in).

The drive is managed by Rubicon's SolarDrive® technology – a purpose-built integrated circuit board that manages gate positioning, solar power regulation, battery charge and the pedestal user interface.

Low maintenance

The FlumeGate's modular design allows it to be maintained in the field with minimal tools, training, and easily replaceable parts.

- Retractable level sensors allow for easy in-field servicing
- Seals can be replaced
- On site diagnostics
- Service can be carried out by local Rubicon field technicians or authorized network independent local integrators

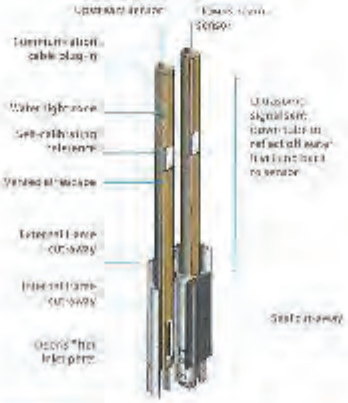
Easy to install

Rubicon's FlumeGate products are designed to retrofit existing check type regulating structures as well as purpose built emplacements significantly reducing costs associated with civil work.

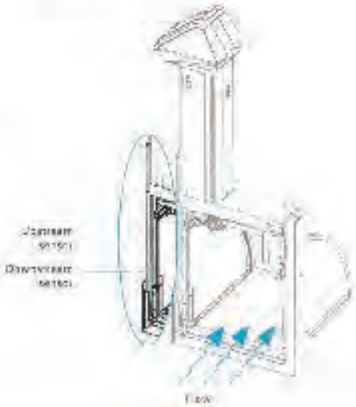
- Installed and operational in two days during irrigation off season
- Factory calibrated and pre-commissioned

Frame corner section

Sensor detail



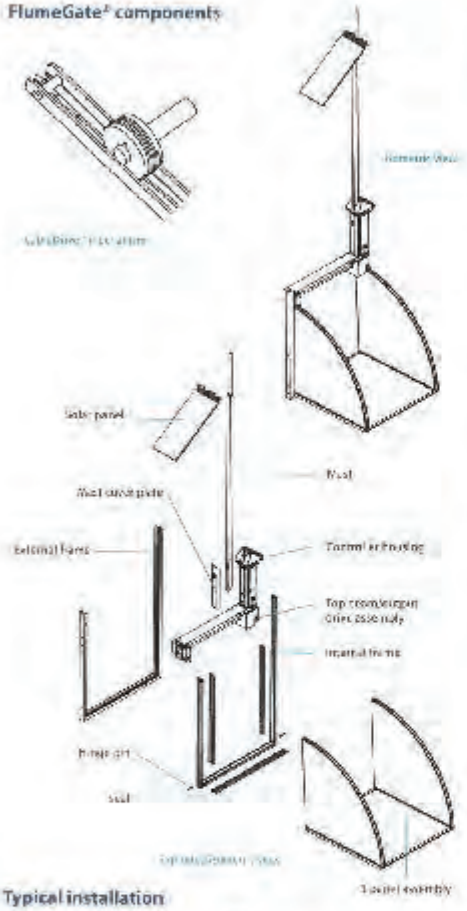
Sensor location



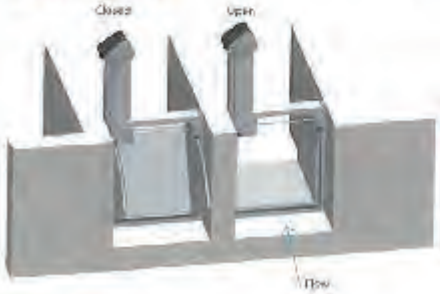
Data Sheet

RUBICON

FlumeGate® components



Typical installation



FlumeGate® specifications

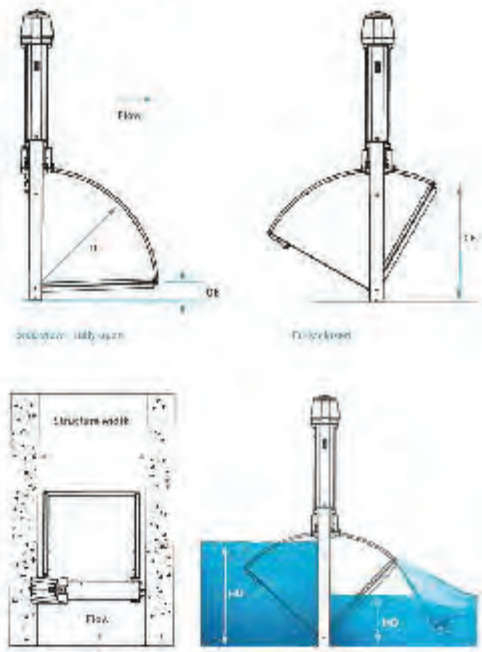
General	
Maximum flowrate	[illegible]
User interface	[illegible]
Data interface	[illegible]
Unit of measure	[illegible]
Local interface language	[illegible]
Data tags	[illegible]
Control	[illegible]
Drive mechanism	[illegible]
Electronics	[illegible]
Motor	[illegible]
Gate position	[illegible]
Seal performance	[illegible]
Actuation options	[illegible]
Flow measurement	
Accuracy	[illegible]
Measurement frequency	[illegible]
Calibration method	[illegible]
Water level measurement	
Technique	[illegible]
Accuracy	[illegible]
Resolution	[illegible]
Material	
Frames	[illegible]
Gate panels	[illegible]
Hardware	[illegible]
Shafts	[illegible]
Seals	[illegible]
Corrosion protection	[illegible]
Hinge	[illegible]
Water level sensors	[illegible]
Standards	[illegible]
Power	
Power supply	[illegible]
Solar panel	[illegible]
Batteries	[illegible]
Communications	

RUBICON®

Dimensions and maximum flow rates

Model	Structure width	Weight	OE	CE	HUmax	HDmax	Q_f	Q_s
	ft	lb	in	in	in	in	cfs	cfs
FGB-0626-0674	2.5	330	4.9	[illegible]	26	25	18	16
FGB-0626-0906		374	5.3	35	30	29	25	18
FGB-0626-1077		423	6.1	41	41	35	30	21
FGB-0626-1273		466	6.5	45	44	40	45	24
FGB-0760-0906	3	365	5.5	35	35	29	31	23
FGB-0760-1077		395	6.3	41	41	36	38	30
FGB-0760-1273		485	6.5	48	46	43	54	36
FGB-1060-0674	4	294	4.9	38	28	31	31	22
FGB-1060-0906		342	5.7	36	35	30	42	36
FGB-1060-1077		408	6.5	41	41	35	54	38
FGB-1060-1273		466	6.5	48	48	43	78	53
FGB-1060-1437		55[illegible]	7.3	55	50	47	52	62
FGB-1060-1587		594	7.3	60	60	54	107	68
FGB-1060-1834		772	7.7	65	60	61	127	79
FGB-1190-0906	4.4	354	5.8	35	35	29	48	34
FGB-1190-1077		419	5.9	41	41	35	62	43
FGB-1190-1273		507	6.5	45	46	42	88	53
FGB-1190-1437		562	7.5	55	55	48	106	73
FGB-1190-1587		717	7.9	60	66	54	122	70
FGB-1370-0674	5	320	4.9	36	28	25	40	31
FGB-1370-0906		386	7.1	35	35	29	56	40
FGB-1370-1077		441	6.3	41	41	36	72	50
FGB-1370-1273		544	6.5	48	48	42	104	66
FGB-1370-1437		655	7.5	56	55	48	123	80
FGB-1370-1587		773	7.9	50	57	54	144	92
FGB-1370-1834		1077	7.7	58	57	52	170	107
FGB-1465-0674	5.4	284	6.1	34	24	19	22	26
FGB-1465-1077		452	6.3	41	41	35	74	55
FGB-1465-1273		551	6.5	45	48	42	115	75
FGB-1465-1437		725	7.5	55	55	46	97	53
FGB-1465-1587		751	7.8	60	60	51	137	101
FGB-1465-1834		891	7.7	68	68	70	152	116
FGB-1575-0674	6	375	4.9	33	28	[illegible]	50	37
FGB-1575-0906		479	[illegible]	35	[illegible]	29	70	51
FGB-1575-1077		507	6.3	41	41	35	90	57
FGB-1575-1273		578	6.5	48	46	42	128	80
FGB-1575-1437		716	7.5	57	55	46	151	98
FGB-1575-1587		794	7.9	60	60	54	179	111
FGB-1575-1834		882	7.7	68	58	62	[illegible]	132
FGB-1575-2160		1298	12.9	81	57	73	[illegible]	164
FGB-1575-3078		2655	16.7	115	[illegible]	125	330	224
FGB-1750-1077	6.4	539	6.3	41	4[illegible]	35	91	67
FGB-1750-1587		855	7.5	66	60	54	141	103
FGB-1750-2160		1631	17.4	87	87	79	232	17[illegible]
FGB-2268-1587	8	882	10.2	66	60	54	270	157
FGB-2268-2160		1220	14.4	87	87	73	376	230
FGB-2268-3078		4405	16.7	115	115	96	550	330

Side and plan views



OE	Fully open gate elevation
CE	Fully closed gate elevation (checking height)
Structure width	Compatible structure width
HUmax	Maximum upstream water level. Note: standard practice is to allow 4 inches of freeboard but this is not mandatory.
HDmax	Maximum downstream water level
Q_f	Maximum flow at freefall condition (HU=HUmax, D=0)
Q_s	Maximum flow at fully submerged condition (HD=HDmax)
R	Gate radius

About Rubicon Water

Rubicon Water delivers advanced technology that optimizes gravity-fed irrigation, providing unprecedented levels of operational efficiency and control, increasing water availability and improving farmers' lives.

Founded in 1995, Rubicon has more than 30 000 gates and meters installed in TCC systems in 15 countries.

www.rubiconwater.com