

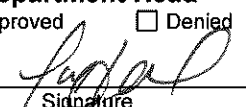
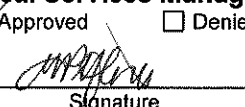
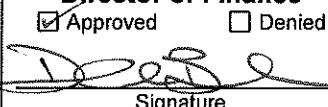
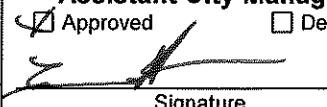


CITY OF HUNTINGTON BEACH

Sole-Source Justification

(For use on all goods and services acquisitions.)

This justification document consists of two (2) pages. All information must be provided and all questions must be answered. The "Required Approvals" section must include a date for each signature, as appropriate for the transaction.

Requesting Department Information			
Date: November 14, 2019			
Requestor Name: Steve Styles		Division Manager: Brian Ragland (Type names. Do not sign.)	
Department: Public Works		Department Head: Tom Herbel (Type names. Do not sign. Must be same as signature below.)	
Department Contact Information			
Contact Name: Steve Styles		Street Address: 19001 Huntington St. HB Calif 92648	
Telephone: 714-374-1512			
Fax: 714-847-1067		Shipping Address: 7512 Garfield Ave HB Calif 92648	
Cellular phone: 714-392-1303			
Required Contact Information			
Contractor/Supplier Name: Murcal			
Contractor/Supplier Address: 41343 12 th St West			
Contractor/Supplier City/State/Zip: Palmdale, Ca 93551			
Original Contract Amount:*		Amendment Amount: (if applicable)	
\$N/A (*Includes original contract and previously approved amendments)		\$N/A (*Current amendment only)	
		New Contract Amount:*	
		\$240,000 (*Includes original contract and all amendments, including current amendment)	
Provide a brief description of the acquisition, including all goods and/or services the contractor will provide:			
Replace obsolete Flood Control pump driver control systems			
Contract Type and Term			
Contract Type:		Contract Term:	
Select One: <input checked="" type="checkbox"/> Goods <input type="checkbox"/> Service <input type="checkbox"/> Goods & Services		Begin: November 18, 2019 End: June 30, 2020	
		What account number will be used to purchase? Business Unit: 32440214 Object Code: 83800	
Required Approvals			
Department Head <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Denied  Signature 12/2/19 Date		Fiscal Services Manager <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Denied  Signature 1/13/20 Date	
		Director of Finance <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Denied  Signature 1/14/20 Date	
		Assistant City Manager <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Denied  Signature 1/15/2020 Date (Transactions exceeding \$50,000 must be approved by City Council)	



CITY OF HUNTINGTON BEACH

Sole Source Justification

(For use on all goods and services acquisitions.)

Complete responses must be provided for all of the following items.

A. THE GOOD/SERVICE REQUESTED IS RESTRICTED TO ONE SUPPLIER FOR THE REASONS STATED BELOW:

1. Why is the acquisition restricted to this goods/services/supplier?

(Explain why the acquisition cannot be competitively bid.)

Murcal (previously Murphy Controls) has been the sole supplier for hardware and software regarding pump driver controls for the City's Flood Control and Water pump stations. Software and sequence of operation cannot be efficiently duplicated using a different manufacturer.

This replaces an expired sole source from 2016 subsequent to others dating back to 1985.

2. Provide the background of events leading to this acquisition.

Existing controls provided by this manufacturer are obsolete and no longer supported by the manufacturer.

3. Describe the uniqueness of the acquisition (why was the good/service/supplier chosen?).

Murcal Software / Sequence of operation is specifically tailored and unique to the city's needs regarding Flood Control pump station operation. See Attached from Murcal.

4. What are the consequences of not purchasing the goods/services or contracting with the proposed supplier?

Existing controls are no longer supported. Therefore, each unit failure renders flood control pumps non operational with regard to automatic operation. A technician would need to manually start, throttle and stop the pump driver. Greatly reducing the effectiveness of the section with responding to other equipment needs during a storm event.

5. What market research was conducted to substantiate no competition, including evaluation of other items considered?

(Provide a narrative of your efforts to identify other similar or appropriate goods/services, including a summary of how the department concluded that such alternatives are either inappropriate or unavailable. The names and addresses of suppliers contacted and the reasons for not considering them must be included OR an explanation of why the survey or effort to identify other goods/services was not performed.)

Using a different manufacturer requires a significant, non-practical investment with software development built over the last 30 years with Murcal (Murphy Controls)

B. PRICE ANALYSIS

1. How was the price offered determined to be fair and reasonable?

(Explain what the basis was for comparison and include cost analyses as applicable.)

Pricing for new series of controls is comparable to the previously supplied and is similar in cost to other PLC which offer very basic (non usable) control architecture

2. Describe any cost savings realized or costs avoided by acquiring the goods/services from this supplier.

Time and money saved by not trying to re-create 30 years of software development with a new manufacturer.

Remit completed form to:

City of Huntington Beach – Purchasing Division
2000 Main Street, Huntington Beach, CA 92648-2702



MurCal, Inc.
41343 12th Street West
Palmdale, CA. 93551
Phone: 661-272-4700
Fax: 661-947-7570
www.murcal.com

December 10, 2019

City of Huntington Beach
2000 Main Street
Huntington Beach, CA 92648

For the Attention of Purchasing Department

To whom it may concern:

Since the early 1960's, we have been fortunate to supply many Booster and Storm Water pumping station controls systems for the City of Huntington Beach. In addition to the various control components included in those panels, we have developed – in consultation with the City's operations staff – unique strategies to handle the control requirements of the water and flood departments. The programmable devices used in these panels are designed, programmed and supported by MurCal, Inc.

The S800 controller is an advanced programmable unit that has been designed for use in the municipal pumping industry. All efforts have been made to utilize the available I/O to support the many needs of the operations staff and to maintain functionality for upgrades to existing stations. In order to maintain quality, documentation, and compatibility, the control components and programming are available – as the single source – from MurCal, Inc.

If you have any questions or require any clarification, please feel free to contact me.

Sincerely,

Jacob Billeter
Staff Engineer
jbilleter@murcal.com



41343 N. 12th Street West
PALMDALE, CALIFORNIA 93551
PHONE (661) 272-4700
FAX (661) 947-7570

January 1, 2018
Revised January 10, 2019

OPERATION DIRECTIONS

MURPHYMATIC® 35-00-071
Central Stormdrain Station Micro-controller
City of Huntington Beach

I. Normal Display:

A. When in the Normal Display Mode on the alphanumeric Liquid Crystal Display (LCD) the following system variables may be selected manually by operating the UP and DOWN ARROW keys,

- 1. MURPHY EMS555 ("title page")**
- 2. CONTROLLER C00071 ("title page")**
- 3. Date (Day Month Year)**
- 4. Time of Day (24 Hour Format)**
- 5. Wet Well Level (Feet)**
- 6. Stage Number**
- 7. Pump #1 Command Speed (RPM) to engine**
- 8. Pump #1 Speed (RPM) from engine**
- 9. Pump #2 Command Speed (RPM) to engine**
- 10. Pump #2 Speed (RPM) from engine**
- 11. Pump #3 Command Speed (RPM) to engine**
- 12. Pump #3 Speed (RPM) from engine**
- 13. Pump #4 Command Speed (RPM) to engine**
- 14. Pump #4 Speed (RPM) from engine**
- 15. (Diagnostic windows follow)**

II. Power Interrupt:

A. When power is restored after a power interruption (supply voltage disconnected, fuse checked or replaced, etc.), the control program will return to a "no run" condition for the pumping station and the pumps will be signaled to restart as necessary.

III. Program Select and Set (PROGRAM SELECT MODE):

- A. **Access to the system variables:** An **ENTRY CODE NUMBER** is necessary to set the Micro-controller to the **PROGRAM SELECT MODE**. In this mode field-programmable system variables may be examined and set.

ENTRY CODE: Press the DOWN ARROW key on the front panel until the "title page" message appears. Then press the center, "CIRCLE" key to display the message, "PROGRAM ENTRY ACTIVE, ENTER CODE #: 0". The UP ARROW and DOWN ARROW keys are then used to cause the display to show the entry code number. When the correct number is displayed -- **YOUR MICRO-CONTROLLER USES CODE # 61** -- the center, "CIRCLE" key is pressed to enter the code number and to place the Micro-controller into the PROGRAM SELECT MODE. The letter "P" followed by "-1" and a written indication of the set-point (i.e. "LINE 1 SELECTION") will be displayed.

If an incorrect number is entered; or, if the entry is not completed within 60 seconds, the display will indicate, "PROGRAM ENTRY ATTEMPT FAILED". Pressing the "Down Arrow" key will cause the "PROGRAM ENTRY ACTIVE, ENTER CODE #: 0" message to again be displayed allowing for a new entry attempt.

- B. **Selecting a Program Number:** Each field-programmable and system generated variable has been assigned a unique "Program Number". First refer to the Program Number Assignment List (beginning on page 5) to determine the number of the desired variable to be examined, set, or altered. Then set the Micro-controller into the PROGRAM SELECT MODE as described above. You may then press the UP ARROW and DOWN ARROW keys as necessary to advance forward or backward through the program numbers until the desired program position has been reached.

- C. When the desired Program Number is displayed, press the center, "CIRCLE" key to display the value stored in that location. Pressing the center, "CIRCLE" key a second time will cause the display to again show the Program Number and allow another variable to be selected.

Note: Once the Micro-controller is in the PROGRAM SELECT MODE, the center, "CIRCLE" key is used to "toggle" between the Program Numbers and their associated, stored values. Each time the center, "CIRCLE" key is pressed the alpha-numeric display will alternate between the Program Number and the value stored in its location.

- D. **Changing System Values:** After the desired Program Number has been selected and the variable has been displayed, the variable may be increased or decreased by operating the UP ARROW key or the DOWN ARROW key on the Front Panel.

Note: When the UP ARROW key or DOWN ARROW key is first pressed the value displayed will change by a count of one (1); if the button is held down continuously, the value will approximately double each .5 second until released.

- E. **Returning to Normal Display from Program Select mode:** If no buttons are pressed for two (2) minutes, the display will automatically revert to one of the Normal Display values and the Micro-controller will exit from the Program Select mode. The Entry Code Number must be re-entered to allow access to the set points.

- F. If immediate return to Normal Display is desired, the DOWN ARROW key is pressed until position P-0 is reached with the message, " 'CIRCLE' TO EXIT" is displayed. When the center, "CIRCLE" key is pressed the controller will exit the Program Select mode to the normal display.

IV. Set-up Programming:

Note: The system setup is accomplished by entering the Setup Mode. The method is similar to entering the Program Select Mode, however, a different Entry Code -- **CODE 64** -- is used: Press the DOWN ARROW key on the front panel until the "title page" message appears. Then press the

center, "CIRCLE" key to display the message, "PROGRAM ENTRY ACTIVE, ENTER CODE #: 0". The UP ARROW and DOWN ARROW keys are then used to cause the display to show the entry code number. When the correct number is displayed the center, "CIRCLE" key is pressed to enter the code number and to place the Micro-controller into the SETUP MODE.

The Position S-1, "Line 1 Selection," will be displayed. Refer to the "Setup Number Assignment List" beginning on page 7 for the setup positions.

A. Adjusting Time of Day, Date, and Day of Week:

1. Time of Day is adjusted in two parts;

- a) The Minute portion (position S-2): The values are adjusted by using the UP and DOWN push buttons until the proper value is read. The seconds portion of the display will "zero" each time the minute value is changed to allow the time to be synchronized with a master time.
- b) The Hour portion (position S-3): The hours are displayed in the 24 hour format -- 7:00 AM is 07:00; 7:00 PM is 19:00. Use the UP and DOWN push buttons until the proper value is read.

2. The Date is adjusted in three parts;

- a) The Day portion (position S-4): Use the UP and DOWN push buttons until the current Day portion (1 through 31) is displayed.
- b) The Month portion (position S-5): Use the UP and DOWN push buttons until the current Month portion (JAN through DEC) is displayed.
- c) The Year portion (position S-6): Use the UP and DOWN push buttons until the current Year portion (to 2000) is displayed.

3. Day of Week is set as above using position S-7. The UP and Down push buttons will allow selection of current day of week; SUNDAY through SATURDAY.

Note: Once set, the Time of Day, Date and Day of Week will update at midnight each day. The Date portion will allow for normal number of days per each month.

B. Calibration of Analog Inputs:

1. The S500 Micro-controller is designed to operate with analog transducers producing 4 to 20 milliampere or 0 to 5 volt D-C signals. The following procedure may be used to check, set or reset the calibration.

2. Refer to the Setup Number Assignment List and select the appropriate "Offset Adjust" Program Number for the analog input to be adjusted. In most cases a zero (0) will be entered into this position. If an offset is desired (such as the case where a level sensing transducer is mounted above the floor of the reservoir or sump), that number is entered in the appropriate units (Feet, PSIG, etc.) The Micro-controller will automatically take the offset into account before displaying the process variable.

Note: When a Calibration position is entered, line one of the display automatically displays the appropriate variable for reference.

3. Next select the Program Number for the appropriate analog "Maximum" adjustment. Enter the maximum range of the analog signaling device in the appropriate engineering units (Feet, PSIG, etc.). Example: If calibrating a level input with a pressure transmitter which outputs 20 milliamperes at 20 Feet, the number 20.0 would be entered into the "Level Maximum" set

point. The Micro-controller will automatically "span" the reading based on this set point.

V. Scan Stall:

- A.** The microprocessor used as the heart of the MURPHYMATIC Micro-controller *scans* through the control instructions and executes them as pre-programmed prior to shipment. The microprocessor uses an internal, crystal controlled "clock" to time the scan. This scan must be in operation for the control system to function properly. If some abnormal condition (i.e. mishandling of printed circuit board, unusually high transient voltage "spike", etc.) occurs, the clock may *stall*.
1. A special circuit on the circuit board monitors, the scan and signals a shutdown circuit to lockout all relays, if the scan is interrupted. The lockout is automatically reset when the Micro-controller is reset and the scan begins proper operation.

VI. Micro-controller *RESET*:

- A.** The Micro-controller may be reset in two ways,
1. If the microprocessor is properly functioning, it will always reset and begin its normal operation when the power is disconnected and then reconnected to the Murphymatic® control panel. Refer to "II. " above.
 2. The microprocessor may also *automatically* reset, if a fault is encountered by the automatic "watch dog" feature.

Note: When a **reset** occurs, the Micro-controller will reset to a no call condition. Pumps currently in operation will shutdown and wait for new start conditions to be satisfied before re-started.

VII. Passive diagnostic included in the Murphy Micro-controller:

- A.** The input and output connectors on the Micro-controller are identified on the drawings by their "JP" and pin numbers. The display shows the condition of the I/O with an "X" (ON) or "O" (OFF).

Examples:

"JP4 2-11 XOOOX OOXOX" -- indicates that inputs are present on JP4, pins 2, 6, 9 and 11. Inputs are inactive on pins 3, 4, 5, 7, 8, and 10.

"JP6 10-18 OOXOX OOXOX" -- indicates the micro-controller is signaling outputs 12, 13, 17, and 18 on JP6 to turn on. Outputs 10, 11, 14, 15, and 16 are off.

PROGRAM NUMBER ASSIGNMENT LIST

	P-0.	Manual 'EXIT' from Program Select mode. Press "'CIRCLE' TO EXIT".
	P-1.	SET FLUSH MINUTES adjustment. Adjusts the minutes portion of flush time of day.
	P-2.	SET FLUSH HOURS adjustment. Adjusts the hours portion of purge time of day.
	P-3.	FLUSH DAY adjustment. Adjusts the day of the week for transducer flush cycle (OFF, SUNDAY through SATURDAY).
MIN.	P-4.	FLUSH DELAY. Duration of flush cycle. Adjustable (0 to 300 minutes).
FEET	P-5.	SUMP START LEVEL. Wet well level to start electric sump pump (0 to 30 feet). (8.0)
FEET	P-6.	SUMP STOP LEVEL. Wet well level to stop electric sump pump (0 to 30 feet). (6.0)
	P-7.	1ST CALL POSITION. Selects which pump will be first call (PUMP 0 through PUMP 5) (1)
	P-8.	2ND CALL POSITION. Selects which pump will be second call (PUMP 0 through PUMP 5) (2)
	P-9.	3RD CALL POSITION. Selects which pump will be third call (PUMP 0 through PUMP 5) (3)
	P-10.	4TH CALL POSITION. Selects which pump will be fourth call (PUMP 0 through PUMP 5) (4)
SEC.	P-11.	LEAD START DLY. First Stage Delay on Start (2 to 300 seconds). (5)
SEC.	P-12.	LEAD STOP DLY. First Stage Delay on Stop (2 to 300 seconds). (5)
SEC.	P-13.	LAG START DLY. Common "Lag" Pump Delay on Start (2 to 300 seconds). (5)
SEC.	P-14.	LAG STOP DELAY. Common "Lag" Pump Delay on Stop (2 to 300 seconds). (5)
FEET	P-15.	START/MAINTAIN. Common Start level for all stages and level for automatic throttle program to maintain (0 to 30 Feet). (12.0)
FEET	P-16.	DEADBAND LEVEL. Zone <i>below</i> Maintain Level where no speed change will be made by the automatic throttle program (0 to 30 Feet). (-1.0)
SEC.	P-17.	DAMPING TIME. Used for setting the reaction rate of the Automatic Throttle Control program (10 to 250 seconds). (20)
FEET	P-18.	STOP LEVEL. Common Stop Level for all engine driven pumps (0 to 30 Feet). (10.0)
FEET	P-19.	LOW WELL LEVEL. Low Wet Well Level Alarm/Override set point (0 to 30.0 Feet). (3.5)
FEET	P-20.	RESET LOW LEVEL. Low Wet Well Level alarm is reset (0 to 30.0 Feet). (4.0)
FEET	P-21.	HIGH WELL ALARM. High Wet Well Level Alarm set point (0 to 50.0 Feet). (19.0)

_____	FEET	P-22.	RESET HIGH WELL. High Wet Well Level alarm is reset (0 to 50.0 Feet). (18.5)
_____		P-23.	SUMP PUMP SEL. Selects mode of operation for the Sump Pump: OFF ON AUTO). (AUTO)
_____		P-24.	SUMP OFF TIME. Length of time sump pump is locked out after main last main pump shuts down in AUTO operation: 0-999 minutes. (30)
		P-25.	LAST SHUTDOWN. Automatically stores last shutdown condition displayed; for future reference.
<u>COMM</u>	RPM	P-26.	ENGINE 1 MAX RPM. Pump #1 Maximum RPM setting. This value via communications link from engine controller.
<u>COMM</u>	RPM	P-27.	ENGINE 1 MIN RPM. Pump #1 Minimum RPM setting.
<u>COMM</u>	RPM	P-28.	ENGINE 1 INC RPM. Pump #1 Rate of Speed Increase.
<u>COMM</u>	RPM	P-29.	ENGINE 1 DEC RPM. Pump #1 Rate of Speed Decrease.
<u>COMM</u>	RPM	P-30.	ENGINE 2 MAX RPM. Pump #2 Maximum RPM setting.
<u>COMM</u>	RPM	P-31.	ENGINE 2 MIN RPM. Pump #2 Minimum RPM setting.
<u>COMM</u>	RPM	P-32.	ENGINE 2 INC RPM. Pump #2 Rate of Speed Increase.
<u>COMM</u>	RPM	P-33.	ENGINE 2 DEC RPM. Pump #2 Rate of Speed Decrease.
<u>COMM</u>	RPM	P-34.	ENGINE 3 MAX RPM. Pump #3 Maximum RPM setting.
<u>COMM</u>	RPM	P-35.	ENGINE 3 MIN RPM. Pump #3 Minimum RPM setting.
<u>COMM</u>	RPM	P-36.	ENGINE 3 INC RPM. Pump #3 Rate of Speed Increase.
<u>COMM</u>	RPM	P-37.	ENGINE 3 DEC RPM. Pump #3 Rate of Speed Decrease.
<u>COMM</u>	RPM	P-38.	ENGINE 4 MAX RPM. Pump #4 Maximum RPM setting.
<u>COMM</u>	RPM	P-39.	ENGINE 4 MIN RPM. Pump #4 Minimum RPM setting.
<u>COMM</u>	RPM	P-40.	ENGINE 4 INC RPM. Pump #4 Rate of Speed Increase.
<u>COMM</u>	RPM	P-41.	ENGINE 4 DEC RPM. Pump #4 Rate of Speed Decrease.
		P-42.	PROGRAM #. Program number and current version. Maintained by Murphy.

SETUP NUMBER ASSIGNMENT LIST

- S-0.** Manual 'EXIT' from Program Select mode. Press " 'CIRCLE' TO EXIT".
- S-1.** Set Time **Minutes**. To adjust the minutes portion of the Real Time Clock.
- S-2.** Set Time **Hours**. To adjust the hours portion of the Real Time Clock.
- S-3.** Set Date **Day**. To adjust the day portion of the date display.
- S-4.** Set Date **Month**. To adjust the month portion of the date display.
- S-5.** Set Date **Year**. To adjust the year portion of the date display.
- S-6.** Set Day of Week. Adjusts day of week Sunday through Saturday.
- S-7.** **CONTROLLER #.** Position for entering the controller number. Used by RS232 communications to identify messages to SCADA system. This is the SCADA address of the pump station. (20)
- S-8.** **ENABLE ENGINE 1.** Selects Engine 1 as available (ON) or not available (OFF) for operation. Central control program and communications programs ignore engines not selected as being available (choices: ON/OFF). (OFF)
- S-9.** **ENABLE ENGINE 2.** Selects Engine 2 as available (ON) or not available (OFF) for operation (choices: ON/OFF). (OFF)
- S-10.** **ENABLE ENGINE 3.** Selects Engine 3 as available (ON) or not available (OFF) for operation (choices: ON/OFF). (OFF)
- S-11.** **ENABLE ENGINE 4.** Selects Engine 4 as available (ON) or not available (OFF) for operation (choices: ON/OFF). (OFF)
- FEET** **S-12.** **LEVEL OFFSET.** Minimum reading (in Feet) with no pressure against level transmitter. Distance level sensor is from bottom of basin. (0.0)
- FEET** **S-13.** **LEVEL MAX.** Maximum of calibrated range of level transmitter in Feet.
- RPM** **S-14.** **MIN ANALOG OUT.** RPM reading from engine controller which is to give a minimum analog signal out to RPM recorder (4 milliamp or 1 VDC). Should be set to zero (0). (0)
- RPM** **S-15.** **MAX ANALOG OUT.** RPM reading from engine controller which represents the maximum analog signal out to RPM recorder (20 milliamp or 5 VDC). Set to maximum reading on chart used in RPM recorders.
- NOTE:** If the chart used in the RPM recorders is printed with a 0 to 1500 range, the two S-#'s are set to zero (0) and 1500, respectively.
- S-16.** **ANALOG SELECTS.** Allows wet well level to be read by analog channel "0" or analog "1" on the S500 board; or analog "0" of the S510 "A" circuit board (when S510 is used).

_____		S-17. CITY PSI SLOPE. Scaling factor for City Water Pressure minimum analog input to C267, 4 ma. Value is used to fine tune minimum signal from analog transmitter. (51)
_____	PSI	S-18. CITY PSI MAX. Scaling factor for City Water Pressure maximum analog input to C267, 20 ma. Enter maximum pressure output value for transmitter. (200)
_____		S-19. FLOW SLOPE. Scaling factor for Sump Pump Flow, minimum analog input to C267, 4 ma. Value is used to fine tune minimum signal from analog transmitter. (51)
_____	GPMx100	S-20. SUMP FLOW MAX. Scaling factor for Sump Pump Flow, maximum analog input to C267, 20 ma. Enter maximum pressure output value for transmitter. (200)
_____	FT³	S-21. FT³ PER PULSE. Amount of flow volume – in cubic feet – per pulse from flow meter. Used for total flow Totalizer. (100)
	FT³ x100	S-22. TOTAL FLOW LO. Value of lower portion of Flow Totalizer. This set point allows the value to be reset. (not included in factory set up function)
	FT³ x100	S-23. TOTAL FLOW HI. Value of upper portion of Flow Totalizer. This set point allows the value to be reset. (not included in factory set up function)
_____	IN.	S-24. INCHES PER PULSE. Amount of rainfall – in inches – per pulse from rain gauge. Used for total rainfall Totalizer. (0.01)
	IN.	S-25. RAIN TOTAL INCHES. Value of lower portion of Rainfall Totalizer. This set point allows the value to be reset. (not included in factory set up function)
	IN.	S-26. RAIN X100 INCHES. Value of upper portion of Rainfall Totalizer. This set point allows the value to be reset. (not included in factory set up function)
_____		S-27. HARDWARE COMM ENABLE. Allows hardware “handshake” feature to be enabled/disabled. (ENABLED)
_____	x10 ms	S-28. FLO CTL RESPONSE: Represents the time that the 555 will wait after it gets the CTS (clear to send) from the DCE (modem, etc). After this “wait” period, it sends out the requested reply. This allows time for the modem or other attached device to get into the correct state to receive the RTS (request to send) from the 555. In most cases there will be no delay required and this can be set to 0. (0)
_____	x100 ms	S-29. FLO CTRL TIMEOUT: Represents the length of time the 555 will wait for the CTS signal from the DCE (modem, etc.) after the 555 (DTE) asserts a RTS to the DCE. This prevents the 555 from being “hung-up” with a non responsive DCE. (10)



MurCal, Inc.

41343 12th Street West
 Palmdale CA 93551
 United States
 661-272-4700
 www.murcal.com

Bill To

Attn: Accounts Payable
 City of Huntington Beach
 P O Box 784
 Huntington Beach CA 92648-0784
 United States

Budgetary Estimate

Page 1 of 2

Date 11/8/2019
 Estimate # 16497

Expiration Date: 12/31/2019
 Sales Rep: K A
 Memo: Slater Avenue Pump S...
 Terms: Net 30
 Ship Via: Truck
 3rd Party Account

Ship To

Water Warehouse
 City of Huntington Beach
 7512 Garfield Avenue
 Huntington Beach CA 92648-2211
 United States

Item	Quantity	Description	Rate	Amount	Item Note
35-18-030, Series 800 Flood Station Central Controller	1	<p>35-18-030, Series 800 Flood Station Central Controller, Slater Avenue Pump Station, City of Huntington Beach</p> <p>24 VDC, central controller to control eight equal sized engine driven pumps and one electric motor driven pumps, housed in a wall mountable 30x24x10 inches enclosure with a hinged and gasketed door. Status/Alarm LEDs, 15" touch screen HMI pre wired and mounted on enclosure door.</p> <p>Central controller is pre-programmed to monitor wet well level and stage pumps on/off to maintain level set point.</p> <p>Auto/Manual alternation of starting position of each pump. Emergency Operation for loss of transducer, high-high float switch, or loss communication. SCADA ready via Modbus TCP/IP and data logging capabilities available.</p>	16,350.00	16,350.00	
S800 Standard Engine Controller (40-16-075)	7	<p>S800 Standard Engine Controller</p> <p>24 VDC, Nat Gas/LPG, single engine controller housed in a wall mountable 30x24x10 inches enclosure with a hinged and gasketed door. Enclosure rated NEMA 4. E-Stop, MAN-OFF-AUTO selector switch, MAN-PRESET-AUTO throttle control selector, NAT GAS-AUTO-LPG fuel selector switch, TATTLETALE®, pilot LEDs, 7" touch screen HMI</p> <p>Safety shutdowns: LOP, HWT, Manifold Vacuum, H/L engine oil level, low gearhead oil pressure, H/L gearhead oil level, high gearhead oil temp, LCL, vibration, high cat temp, H/L discharge pressure, low suction pressure, overspeed, overcrank, loss of speed, throttle failure.</p> <p>Basic engine automatic control features: throttle rate of increase/decrease, cycle cranking, warmup/cooldown, delay on start/stop.</p>	10,950.00	76,650.00	
S800 Standard Engine Instrument Panel (30-16-080)	7	<p>S800 Standard Engine Instrument Panel housed in 20x16x10 inches NEMA 4 enclosure, painted red.</p> <p>Ass'y/Bill of Material. Includes SWICHGAGE® gauges for Engine Oil Pressure, Engine Water Temperature, Engine Oil Temperature, LB & RB Manifold Vacuum Pressure, Gearhead Oil Pressure, Gearhead Oil Temperature, and digital Tachometer.</p>	3,830.00	26,810.00	
Pump Station Start Up (2 days)	1	Pump station start up costs for two days.	3,000.00	3,000.00	



Budgetary Estimate

MurCal, Inc.

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Palmdale CA 93551
United States
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Date

11/8/2019

Estimate #

16497

Item	Quantity	Description	Rate	Amount	Item Note

Lead time is 12-16 weeks after approval of submittal

Subtotal	122,810.00
Estimated Ship Cost (FOB Ship Point) (Truck)	450.00
Tax (CA_ORANGE CO_EMAZ_EMTN 7.75%)	9,285.28
Total	\$132,545.28

MurCal appreciates the opportunity to offer this budgetary estimate. This estimate is based on the current information we have for your application. As we work through this process, the estimate is subject to change.