VARIANCE REQUEST
Iowa Department of Natural Resources

1.	Date:	11/15/12	14.	Decision: Approved Date: 11/16/12
2.	Reviewer/Engr.:	Larry Bryant		
3.	Date Received:	11/9/12		
4.	Facility Name:	City of Ft. Dodge WWTF		
5.	Facility Number:	9433003		
6.	County Number:	94 (Webster)	15.	Appealed: Date:
7.	Program Area:	CP (Wastewater Construction)		
8.	Facility Type:	C05 (Biological Treatment)		
9.	Subject Area:	401 (Flow Splitting)		
10.	Rule Reference:	567 IAC 64.2(9)		
11.	Design Std. Ref.:	14.4.9.2		
12.	Consulting Engr.:	McClure Engineering		
13.	Variance Rule:	567 IAC 64.2(9)"c"		

16. Description of Variance Request:

The City of Fort Dodge is requesting a variance from IWWFDS 14.4.9.2, which requires a central collection and distribution point including proportional flow splitting for unit process operations where duplicate units are provided. The City is currently in the process of upgrading its WWTF including the addition of a new 3rd Vertical Loop Reactor (VLR - an activated sludge process variant) and a new 4th final clarifier. A non-centralized flow splitting arrangement consisting of one splitter box combining flows from VLRs 1 & 2 and distributing to final clarifiers 1, 2 & 3, and a second splitter box receiving flows from VLR # 3 and distributing to final clarifiers 3 & 4 is proposed. As shown in the variance petition schematics, Clarifier # 3 would be connected to both splitter boxes while final clarifiers 1, 2 & 4 would be connected to only one of the two splitter boxes.

17. Applicant's/Consulting Engineer's Justification:

The applicant's/consulting engineer's justifications are included in the attached variance petition. To paraphrase:

- A single distribution chamber & associated piping are not feasible due to space constraints, conflicts with existing piping & associated cost.
- *Sufficient clarifier area and reliability is provided such that normal operation will be three final clarifiers online with one remaining in standby.*
- Proportional flow splitting can be achieved by the proposed arrangement for any combination of three final clarifiers online.
- A proportional flow split with all four final clarifiers online can be obtained by blocking off a portion of the weirs and combining flows from the two splitter boxes into Final Clarifier # 3.

18. Department's Justification:
Conditional approval is recommended based on the total available clarifier area. See the attached memorandum for a complete discussion of the rationale behind this recommendation. Approval is recommended only under the following conditions:

- The variance is approved only for the design flows and loadings associated with the

current project. • The variance is approved only for the treatment configuration associated with the current project, including a total of three VLRs and four final clarifiers.
19. Precedents Used: Des Moines WRA (approved 3/6/87) – submerged splitting based on symmetrical piping City of Eagle Grove (denied 6/23/03) – submerged asymmetrical splitting
20. Staff Reviewer: [signature] Date: 11/15/12
21. Supervisor: [signature] Date: 11/15/12
22. Authorized by: [signature] Date: 11-16-12

Fields of Opportunities

STATE OF IOWA

TERRY E. BRANSTAD, GOVERNOR
KIM REYNOLDS, LT. GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
CHUCK GIPP, DIRECTOR

November 15, 2012

Chad Schaeffer, P.E.
City of Fort Dodge
819 1st Avenue South
Fort Dodge, IA 50501

RE: Phase D Wastewater System Improvements 2011 - Section 1 WPCF Expansion
City of Fort Dodge
DNR Project No. S2012-0183
CWSRF No. CS1920064501

Subject: Variance Request from 567 IAC 64.2(9) and Design Standard 14.4.9.2

Dear Mr. Schaeffer:

After careful and thorough consideration, the Department has ***conditionally approved*** your request for a variance from Iowa Administrative Code Subrule 567 IAC 64.2(9) and Section 14.4.9.2 of the Iowa Wastewater Facilities Design Standards, which requires a central collection and distribution point including proportional flow splitting for unit process operations where duplicate units are provided. ***The conditions associated with the variance approval are stated on Page 2 of this letter.***

Based on the documentation presented by your Engineer, it is the determination of this Department that satisfactory justification has been presented to warrant the granting of a variance from the design standard. The requested variance is deemed to be necessary and appropriate pursuant to the Iowa Code section 455B.181.

The facts presented for the project present unique circumstances and the variance is therefore justified to provide the narrowest exception possible to the provisions of the rule in accordance with Rule 561 IAC 10.5. Since the project planning and construction may last more than one year, the variance is considered to be of a permanent nature under the conditions cited below. The validity of this variance approval shall last for a period of one year from the date of the construction permit in accordance with Rule 561 IAC 10.5.

This decision is based on our review of justification presented to support the request. Our concurrence with the request is based on the Department's finding that the resulting project will provide substantially equivalent effectiveness as would be provided by technical compliance with the design standard on this issue.

This variance approval is subject to the following **conditions and requirements**:

1. The variance approval is valid only for the approved design flows and loads for the 2011 Phase D project. These are stated in Design Schedule G dated 12/23/11, the WPCF Flow Schematic dated 11/06/12 and Design Schedule O dated 5/08/12. A separate evaluation of the flow splitting arrangement will be required for future design flow, loading or MLSS values that would increase the hydraulic or solids loadings to the final clarifiers.

2. The variance approval is valid only for the currently proposed 2011 Phase D treatment configuration including a total of three Vertical Loop Reactors (VLRs) and four final clarifiers. A separate evaluation of the flow splitting arrangement will be required if additional treatment units are added in the future.

Additional background information regarding our determination is enclosed.

Please feel free to contact Larry Bryant at 515-281-6759 or larry.bryant@dnr.iowa.gov if you have any questions.

Sincerely,

Shelli Grapp

Shelli Grapp
Water Quality Bureau Chief

cc: McClure Engineering Co./Fort Dodge
DNR FO # 2
DNR Sewage File 6-94-33-0-03
SRF File CS192064501
DNR Legal Services

Enclosures

Fields of Opportunities

STATE OF IOWA

TERRY E. BRANSTAD, GOVERNOR
KIM REYNOLDS, LT. GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
ROGER L. LANDE, DIRECTOR

MEMO

Wastewater Engineering Section

DATE: 11/15/12

TO: WES Variance File; City of Fort Dodge Sewage File

FROM: Larry Bryant

Subject: Final Clarifier Flow Split
City of Fort Dodge Phase D 2011 Wastewater System Improvements

Background

The City of Fort Dodge is currently in the process of upgrading its wastewater treatment facility including the addition of a 3rd VLR and a 4th final clarifier. A 4th VLR and 5th final clarifier are planned for the future.

Currently, effluent from the two existing VLRs is divided amongst the three existing clarifiers via a common 3-way splitter box attached to VLR # 1. Effluent from VLR # 2 is directed to the existing splitter box by a 42" pipe.

With addition of the 3rd VLR and 4th final clarifier, a revised flow splitting arrangement is proposed. The existing splitter box and piping arrangement would be retained. A new splitter box would be added to split flows from VLR # 3 into clarifiers # 3 and # 4, as well as # 5 in the future. The two splitter boxes would not be hydraulically interconnected although both would be capable of directing VLR effluent to Clarifier # 3.

The proposed arrangement would not meet Section 14.4.9.2 of the Iowa Wastewater Facilities Design Standards, which requires a central collection and distribution point including proportional flow splitting before each unit operation where duplicate units are provided. The City has requested a variance from the design standard.

Purpose of the Design Standard and Effect of the Proposed Variance

Section 14.4.9.2 of the IWFDS is titled "Flexibility", and as the name implies, is structured to provide operational flexibility to any given unit process. The requirement for central flow splitting accomplishes two primary goals:

(1) It allows a plant operator to equally split flows between each basin in a unit process no matter which or how many units are online. When a basin is taken offline, flow

between the remaining online units is automatically balanced. That is, taking any basin(s) offline is simply a matter of closing a valve or gate.

(2) It establishes independent operation of upstream and downstream unit processes. For example, taking any upstream VLR offline does not affect the operation of downstream final clarifiers.

Effect of Proposed Variance

Under the proposed configuration flows among the final clarifiers could not be split evenly with all units online unless two of the five weirs are adjustable in length, which the City/consultant mentions in the petition. Weir heights are typically adjustable but weir lengths are normally fixed. The design details and operational specifics of how the weir lengths would be modified in the field to accommodate an equal 4-way split is not detailed in the variance petition or project plans and specifications. Also, it is not clear from the petition if the City intends to provide whatever equipment would be necessary to accomplish this as part of the project.

However, the issue of balancing flows via adjustment of the weirs is largely irrelevant since the proposed splitting arrangement does not allow independent operation of the VLRs and final clarifiers. In a number of operational scenarios for both immediate (3 VLRs, 4 final clarifiers) and future (4 VLRs, 5 final clarifiers) configurations the lack of central flow splitting at this facility will prohibit independent operation of the VLRs and final clarifiers. Lack of independent operation under these scenarios would result in either (a) two out of four final clarifiers offline simultaneously or (b) asymmetric flow splits which could not be corrected by the use of differing weir lengths.

See the **Operational Scenarios** section beginning on Page 3 of this memo for the detailed evaluation of operational scenarios that would normally be addressed by the design standard but are not by the proposed configuration.

Equivalency of the Proposed Configuration

Per 567 IAC 64.2(9), variances from the design standards which "provide in the judgment of the department for substantially equivalent or improved effectiveness" as would otherwise be afforded by meeting the standard may be considered. As described previously, the proposed variance cannot be considered equivalent to the design standard on a one-for-one basis. However, the total proposed clarifier area at this facility greatly exceeds that which would normally be required based on hydraulic and solids loading rate criteria. The design standards can be met at the design AWW and PHWW flows considering only three final clarifiers online or at 75% of the design flows with two units online. Therefore, the variance can be considered equivalent to the design standard provided that the final clarifier unit process is de-rated to consider worst-case scenarios with asymmetric flow splits or one VLR and two final clarifiers simultaneously offline. ***This essentially de-rates the unit process by one final clarifier.***

Recommendation

Based on the above considerations, variance approval is recommended. However, the splitting configuration should only be considered equivalent at the currently proposed design AWW and PHWW flows through the final clarifiers of 12.2 mgd and 18.7 mgd, respectively.

Future Implications

The flow splitting arrangement will have an effect on the future rated capacity of the final clarifiers if increased plant design flows are proposed as well as if/when a 4th VLR and/or a 5th final clarifier are added in the future. Although de-rated capacities can be calculated based on the future arrangement shown in the variance petition they are speculative at this time. In addition, this variance, if approved, should not preclude consideration of any future issues associated with the decentralized splitting arrangement under differing operational conditions, including RAS pumping capabilities sufficient to maintain design RAS withdrawal rates from any given clarifier proportional to the flow split. Therefore, this variance approval should be limited to the currently proposed configuration including a total of three VLRs and four final clarifiers at the currently approved design flows and loads.

Operational Scenarios

Proposed Configuration Scenarios: VLR and Final Clarifier Operational Scenarios (20 total) for 3 Available VLRs and 4 Available Final Clarifiers with Splitting Arrangement as Proposed in Variance Petition, Considering the Possibility of Modifiable Weir Lengths. (Scenarios for simultaneous removal of 1 VLR and 1 Final Clarifier from service only).

Scenario #	Scenario	Even Flow Split w/installed weirs?	Even Flow Split Possible w/Differing Weir Lengths?	Notes	Even Flow Split w/Configuration Meeting Design Standards?
1	3 VLRs online, 4 FCs online	No	Yes. Weir # 3 = 8'. Weir # 4 = 4'.	No details on how the weirs would be adjusted	Yes
2.a – d	3 VLRs online, 3 FCs online	Yes	N/A	For any one of the 4 FCs taken offline.	Yes
3.a	VLR # 1 offline, 4 FCs online	Yes	N/A	Close Valve # 3.	Yes
3.b	VLR # 2 offline, 4 FCs online	Yes	N/A	Close Valve # 3.	Yes

3.c	VLR # 3 offline, 4 FCs online	No	No	Configuration not possible. Operation of FC # 4 not possible with VLR # 3 offline. Only FCs # 1 - 3 can remain operational under this scenario.	Yes
4.a	VLR # 1 offline, FC # 1 offline	No	Yes. Weir # 3 and # 4 = 6'.	No details on how the weirs would be adjusted	Yes
4.b	VLR # 1 offline, FC # 2 offline	No	Yes. Weir # 3 and # 4 = 6'.	No details on how the weirs would be adjusted	Yes
4.c	VLR # 1 offline, FC # 3 offline	No	No	Even flow split not possible under this configuration.	Yes
4.d	VLR # 1 offline, FC # 4 offline	No	No	Even flow split not possible under this configuration.	Yes
5.a	VLR # 2 offline, FC # 1 offline	No	Yes. Weir # 3 and # 4 = 6'.	No details on how the weirs would be adjusted	Yes
5.b	VLR # 2 offline, FC # 2 offline	No	Yes. Weir # 3 and # 4 = 6'.	No details on how the weirs would be adjusted	Yes
5.c	VLR # 2 offline, FC # 3 offline	No	No	Even flow split not possible under this configuration.	Yes
5.d	VLR # 2	No	No	Even flow	Yes

	offline, FC # 4 offline			split not possible under this configuration.	
6.a	VLR # 3 offline, FC # 1 offline	No	No	Configuration not possible. Operation of FC # 4 not possible with VLR # 3 offline. If VLR # 3 is offline at the same time as FC # 1 only two operational clarifiers remain available.	Yes
6.b	VLR # 3 offline, FC # 2 offline	No	No	Configuration not possible. Operation of FC # 4 not possible with VLR # 3 offline. If VLR # 3 is offline at the same time as FC # 2 only two operational clarifiers remain available.	Yes
6.c	VLR # 3 offline, FC # 3 offline	No	No	Configuration not possible. Operation of FC # 4 not possible with VLR # 3 offline. If VLR # 3 is offline at the same time as FC # 3	Yes

				only two operational clarifiers remain available.	
6.d	VLR # 3 offline, FC # 4 offline	Yes	N/A		Yes

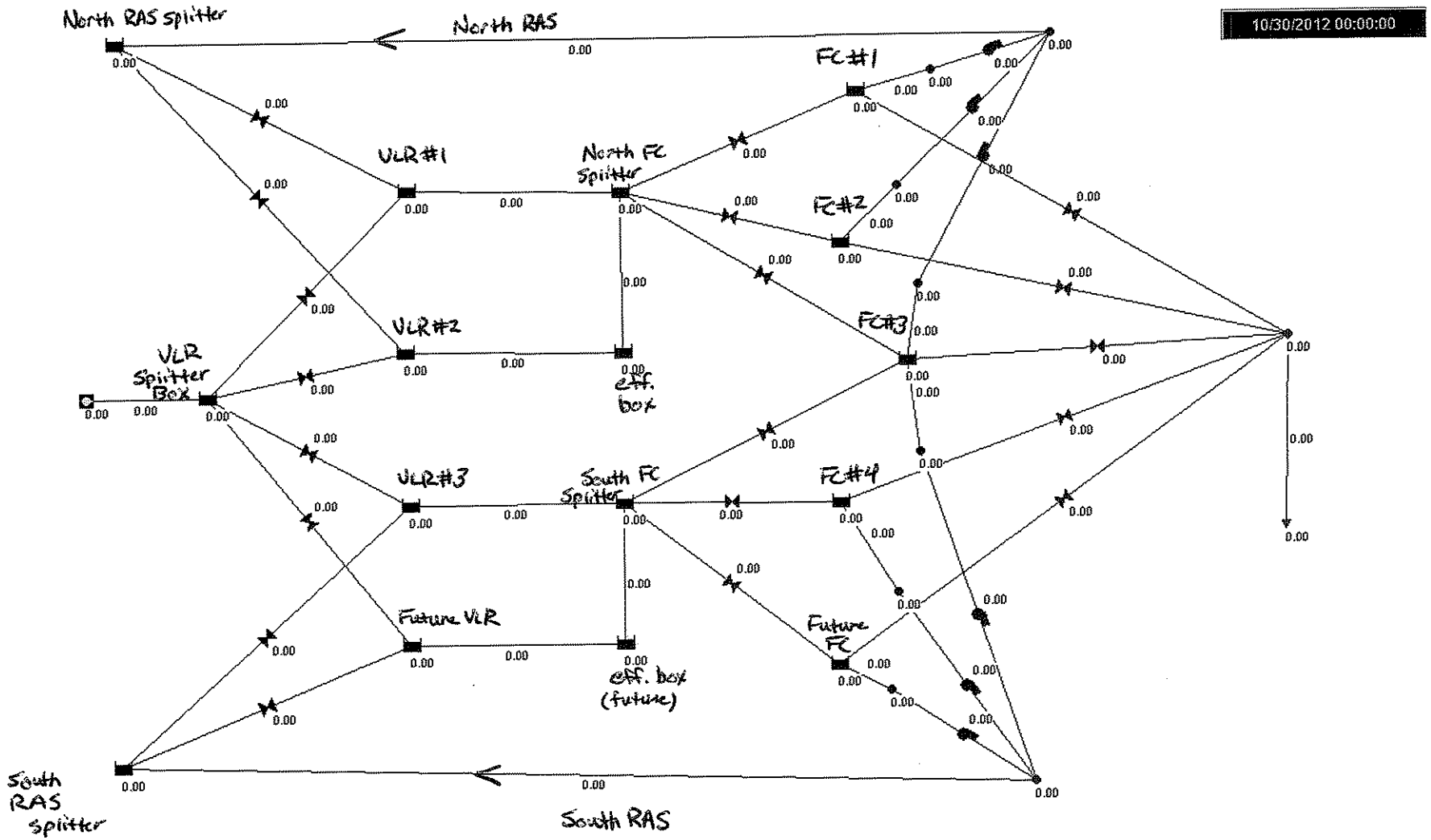
Future Configuration Scenarios: VLR and Final Clarifier Operational Scenarios (30 total) for 4 Available VLRs and 5 Available Final Clarifiers with Splitting Arrangement as Proposed in Variance Petition, Considering the Possibility of Modifiable Weir Lengths. (Scenarios for simultaneous removal of 1 VLR and 1 Final Clarifier from service only).

Scenario #	Scenario	Even Flow Split w/installed weirs?	Even Flow Split Possible w/Differing Weir Lengths?	Notes	Even Flow Split w/Configuration Meeting Design Standards?
1	4 VLRs online, 5 FCs online	No	Yes. Weir # 3 = 6'. Weir # 4 = 6'.	No details on how the weirs would be adjusted	Yes
2.a - e	4 VLRs online, 4 FCs online	Yes	N/A	For any one of the 5 FCs taken offline.	Yes
3.a - d	Any single VLR offline, 5 FCs online	No	No	Even flow splits not possible under these configurations.	Yes
4.a	VLR # 1 offline, FC # 1 offline	No	Yes. Weir # 3 = 4' and Weir # 4 = 8'.	No details on how the weirs would be adjusted	Yes
4.b	VLR # 1 offline, FC # 2 offline	No	Yes. Weir # 3 = 4' and Weir # 4 = 8'.	No details on how the weirs would be adjusted	Yes
4.c	VLR # 1 offline, FC # 3 offline	No	No	Even flow split not possible under this configuration.	Yes
4.d	VLR # 1	No	No	Even flow split	Yes

	offline, FC # 4 offline			not possible under this configuration.	
4.e	VLR # 1 offline, FC # 5 offline	No	No	Even flow split not possible under this configuration.	Yes
5.a	VLR # 2 offline, FC # 1 offline	No	Yes. Weir # 3 = 4' and Weir # 4 = 8'.	No details on how the weirs would be adjusted	Yes
5.b	VLR # 2 offline, FC # 2 offline	No	Yes. Weir # 3 = 4' and Weir # 4 = 8'.	No details on how the weirs would be adjusted	Yes
5.c	VLR # 2 offline, FC # 3 offline	No	No	Even flow split not possible under this configuration.	Yes
5.d	VLR # 2 offline, FC # 4 offline	No	No	Even flow split not possible under this configuration.	Yes
5.e	VLR # 2 offline, FC # 5 offline	No	No	Even flow split not possible under this configuration.	Yes
6.a	VLR # 3 offline, FC # 1 offline	No	No	Even flow split not possible under this configuration.	Yes
6.b	VLR # 3 offline, FC # 2 offline	No	No	Even flow split not possible under this configuration.	Yes
6.c	VLR # 3 offline, FC # 3 offline	No	No	Even flow split not possible under this configuration.	Yes
6.d	VLR # 3 offline, FC # 4 offline	No	Yes. Weir # 3 = 8' and Weir # 4 = 4'.	No details on how the weirs would be adjusted	Yes
6.e	VLR # 3	No	Yes. Weir #	No details on	Yes

	offline, FC # 5 offline		3 = 8' and Weir # 4 = 4'.	how the weirs would be adjusted	
7.a	VLR # 4 offline, FC # 1 offline	No	No	Even flow split not possible under this configuration.	Yes
7.b	VLR # 4 offline, FC # 2 offline	No	No	Even flow split not possible under this configuration.	Yes
7.c	VLR # 4 offline, FC # 3 offline	No	No	Even flow split not possible under this configuration.	Yes
7.d	VLR # 4 offline, FC # 4 offline	No	Yes. Weir # 3 = 8' and Weir # 4 = 4'.	No details on how the weirs would be adjusted	Yes
7.e	VLR # 4 offline, FC # 5 offline	No	Yes. Weir # 3 = 8' and Weir # 4 = 4'.	No details on how the weirs would be adjusted	Yes

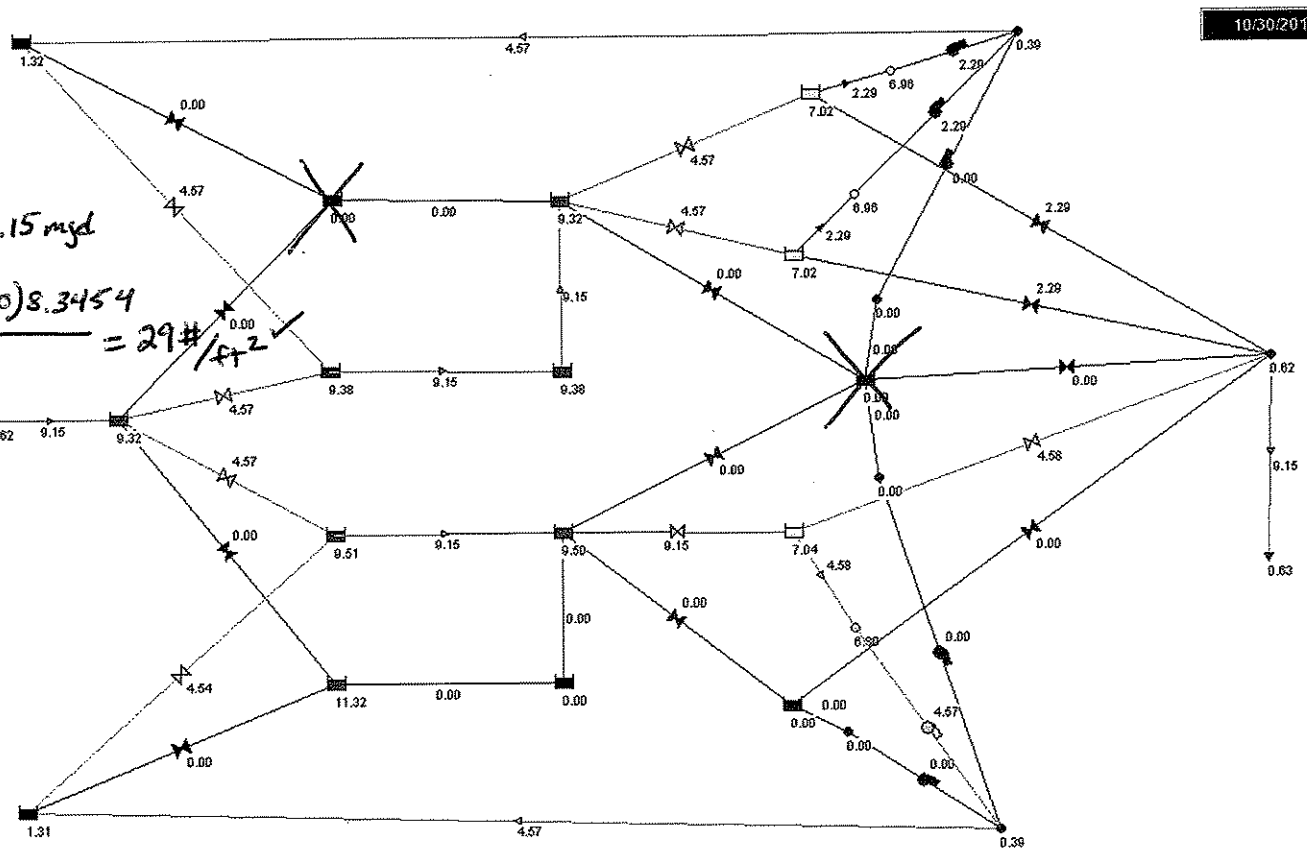
SWMM Schematic of Splitting Arrangement

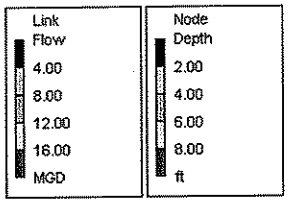


Scenario 4.C, VLR #1 offline & FC#3 offline @ AWW condition, 75% reliability

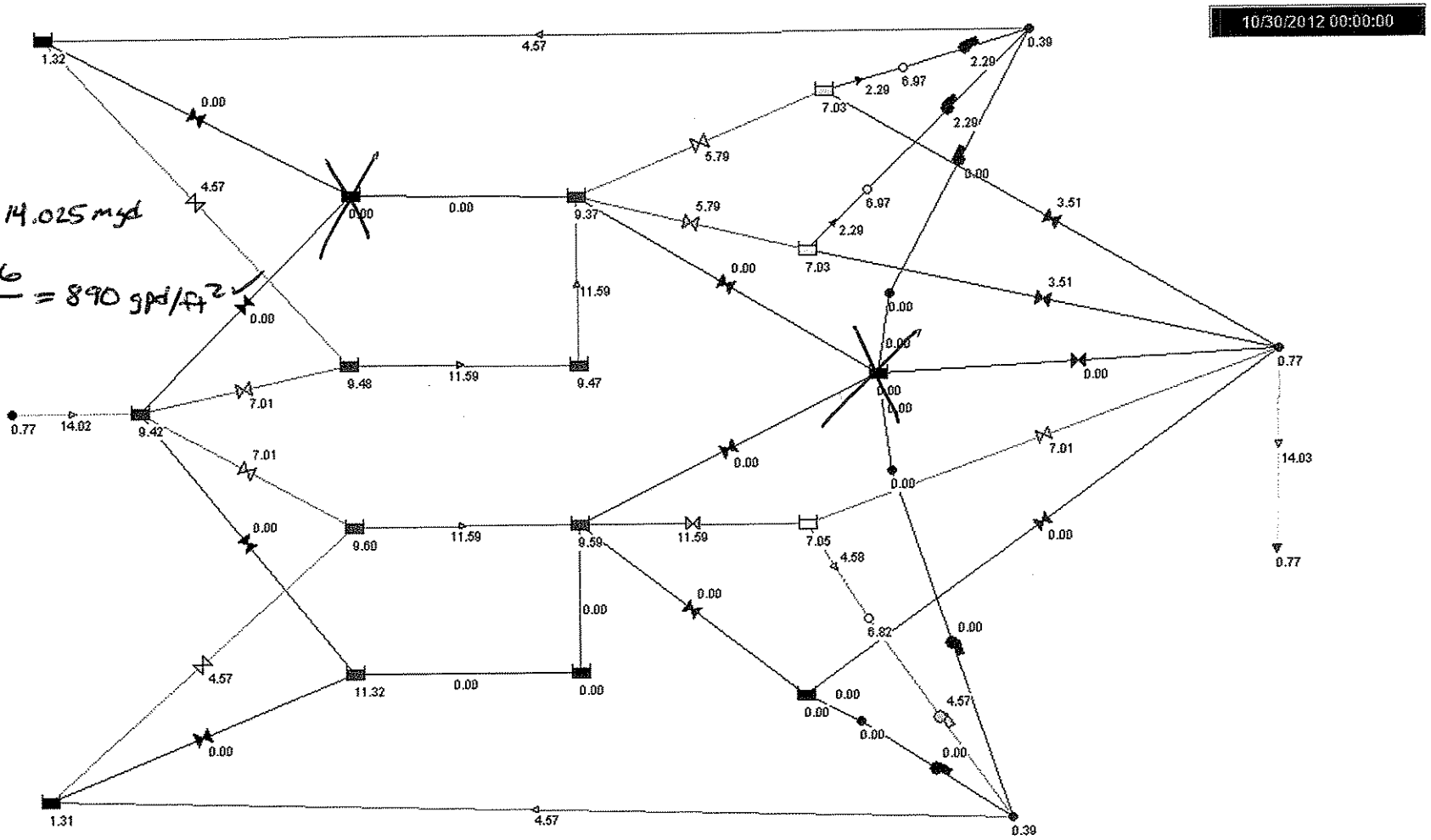
$0.15(12.2) = 9.15$ mgd

$SLR = \frac{9.15(3000)8.3454}{100^2 \frac{\pi}{4}} = 29\#/ft^2$





Scenario 4.C, VLR #1 offline & FC#3 offline @ PHWW condition, 75% reliability



0.75(18.7) = 14.025 mgd

SOR = $\frac{7.01 E6}{(100)^2 \frac{\pi}{4}}$ = 890 gpd/ft²

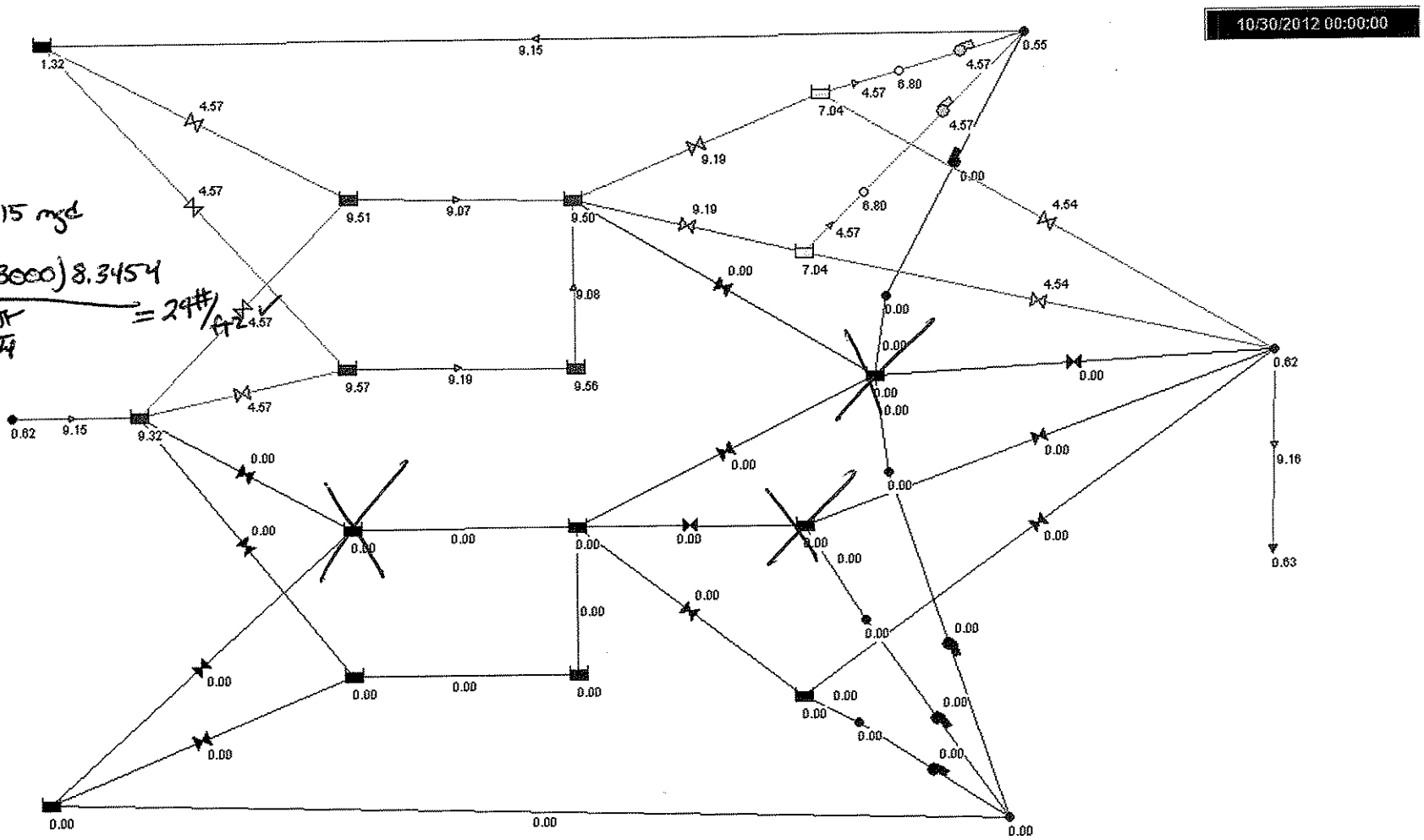
Link Flow
4.00
8.00
12.00
16.00
MGD

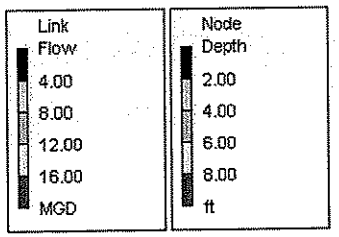
Node Depth
2.00
4.00
6.00
8.00
ft

Scenario 6.C. VLR #3 offline (FC# 4 offline) & FC#3 offline @ AWW condition, 75% reliability

0.75 (12.2) = 9.15 mgd

SLR = $\frac{9.15\ (3000)\ 8.3454}{(100^2)\ \frac{\pi}{4}}$ = 29#/ft²

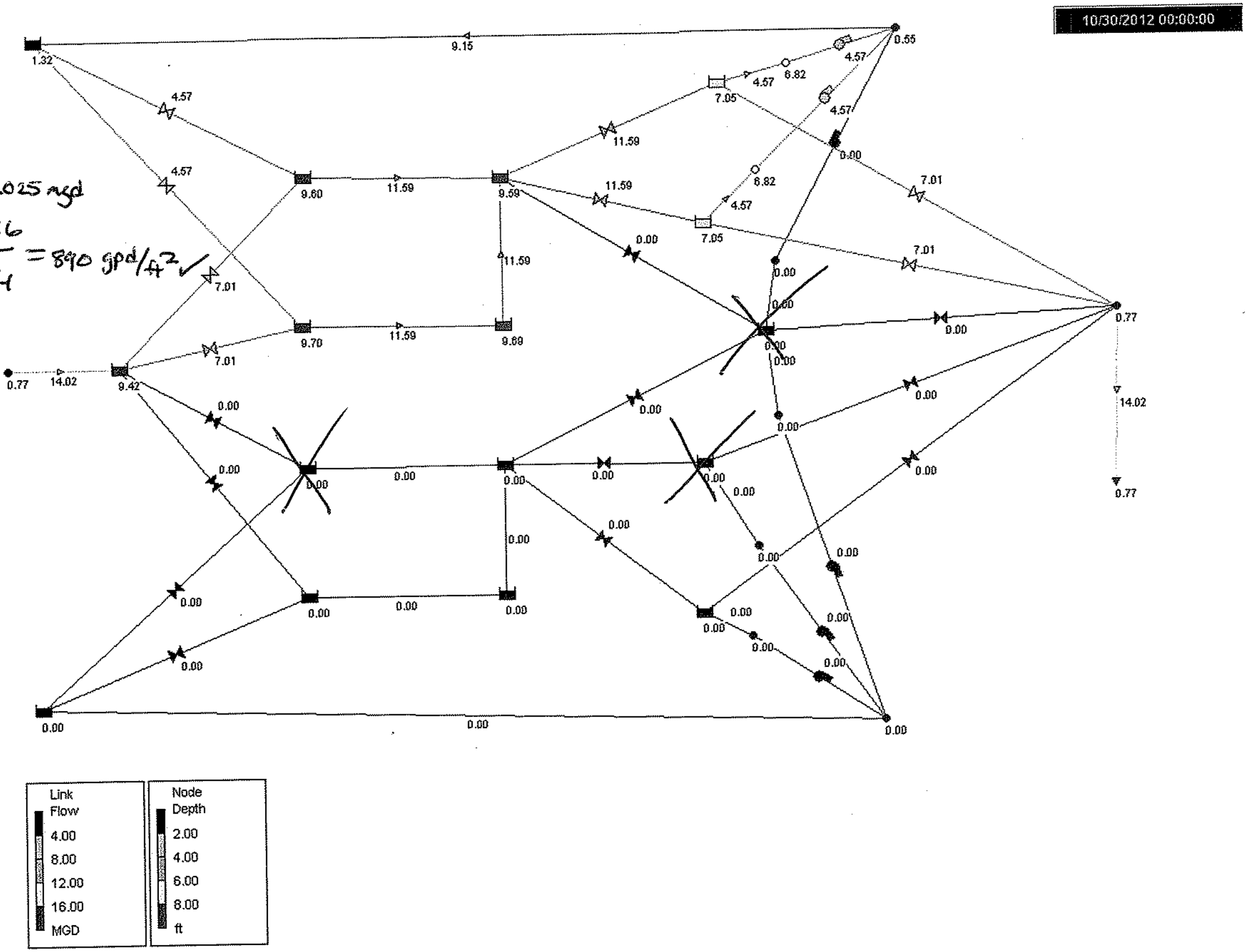




Scenario 6.C @ PHWW condition, 75% reliability

0.75 (18.7) = 14.025 mgd

SOR = $\frac{7.01E6}{(100)^2 \pi/4}$ = 890 gpd/ft² ✓



S2013-0059

McCLURE ENGINEERING CO.
705 First Avenue North
Fort Dodge, IA 50501
515-576-7155
Fax: 515-576-4235

MCCLURE
ENGINEERING COMPANY
MEC results.com

LETTER OF TRANSMITTAL

DATE 11/7/12	JOB NO. 1311016-04
ATTENTION Larry Bryant	
RE: Wastewater System Imp 2011	
Phase D Section 1	

TO: Iowa Department of Natural Resources
Wallace Building
502 East 9th Street
Des Moines, IA 50319

WE ARE SENDING YOU ☐ Attached ☐ Under Separate Cover via _____ the following items:

☐ **Shop drawings** ☐ **Prints** ☐ **Plans** ☐ **Samples** ☐ **Specifications**

☐ **Copy of letter** ☐ **Change Order** ☒ Petition for Variance

COPIES	DATE	NO.	DESCRIPTION
1			Petition of Variance

THESE ARE TRANSMITTED as checked below:

☐ **For approval** ☐ **Approved as submitted** ☐ **Resubmit ____ copies for approval**

☐ **For your use** ☐ **Approved as noted** ☐ **Submit ____ copies for distribution**

☐ **As requested** ☐ **Returned for corrections** ☐ **Return ____ corrected prints**

☐ **For review and comment** ☐ _____

☐ **FOR BIDS DUE** _____ **20____** ☐ **PRINTS RETURNED AFTER LOAN TO US**

REMARKS Any questions, please call

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COPY TO Chad Schaeffer, City of Fort Dodge, IA **SIGNED:** Michael Washburn

52013-0059

BEFORE THE IOWA DEPARTMENT OF NATURAL RESOURCES
DES MOINES, IOWA

CITY OF FORT DODGE, IOWA 819 1ST AVENUE SOUTH FORT DODGE, IA 50501 (515) 573-5751	PETITION FOR VARIANCE

The Petitioner, pursuant to Iowa Code Section 17A.9A and 561 Iowa Administrative Code 561-10, and requests a Variance from Iowa Wastewater Facilities Design Standard 14.4.9.2. Petitioner provides the following information pursuant to Iowa Administrative Code 561-10.9(1) through 561-10.9(10):

10.9 (1) *The name, address and telephone number of the entity or person for whom a waiver or variance is requested.*

City of Fort Dodge, Iowa
819 1st Avenue South
Fort Dodge, IA 50501
Telephone: (515) 573-5751

10.9 (2) *A description and citation of the specific rule from which a waiver or variance is requested.*

Iowa Wastewater Facilities Design Standard 14.4.9.2 (Flexibility) as follows:

Where duplicate units are provided, a central collection and distribution point including proportional flow splitting shall be provided for the wastewater flows before each unit operation. Exceptions to this requirement may be made, on a case-by-case basis, when the design incorporates more than one unit process in the same physical structure.

10.9 (3) *The specific waiver or variance requested, including precise scope and operative period that the waiver or variance will extend.*

The petitioner requests a variance of the requirement that "a central collection and distribution point including proportional flow splitting shall be provided for the wastewater flows before each unit of operation..." as required by Iowa Wastewater Facilities Design Standard 14.4.9.1 (Flexibility). The unit of operation in question is the Final Clarifiers following the Vertical Loop Reactors (VLR).

The proposed improvements are being driven by the City's anticipated growth over the 20 year design period and the immediate proposed expansion of the North Central Ag-Park resulting in increased flows and loading to the Water Pollution Control Facility (WPCF), above the current design capacity. The proposed improvements include the construction of one (1) new VLR, identical in size and capacity as the Water Pollution Control Facility's (WPCF) existing two (2) VLR units, and one (1) new 100-ft diameter Final Clarifier identical in size and capacity as the WPCFs existing three (3) Final Clarifier units. Please see attached site plan provided in Appendix A for further description.

The proposed improvements include two (2) separate flow distribution points, in lieu of one "central collection and distribution point". The 2 separate flow distribution points are located

in existing VLR No.1 and proposed VLR No. 3, respectively. Each flow distribution point consists of three fixed 12-ft weir plates that work together in proportionally splitting effluent flow from the VLRs to on-line Final Clarifiers. The proposed requested variance is to be permanent and shall be utilized for both current and future expansions of the WPCF.

10.9 (4) *The relevant facts that the petitioner believes would justify a waiver or variance. The factual statement is to include a signed statement from the petitioner attesting to the accuracy of the facts provided in the petition and a statement of reasons that the petitioner believes will justify a waiver or variance.*

A single distribution chamber located between the VLRs and the Final Clarifiers has been evaluated and deemed unfeasible to construct based on the allowable physical space, conflicts with existing piping, and overall anticipated construction costs required for bringing all the effluent flow to the flow splitter and distributing it to the Final Clarifiers. Please see the included exhibits provided in Appendix B. These exhibits show new influent pipes to the central distribution chambers of existing Final Clarifiers No. 2 and 3 would be required. These pipes would have to be constructed underneath the existing concrete floors of the clarifiers. This is impracticable to construct and would add significant cost to the project to make modifications to existing structures.

Per Iowa Wastewater Facility Design Standards for Settling (Chapter 16) and the submitted Basis of Design Loadings and Flows, only three of the four Final Clarifiers (or 1 Clarifier per VLR) are required for adequate treatment. The fourth Final Clarifier is being provided to allow the WPCF to meet the Wastewater Facility Design Standards reliability requirements (per Chapter 14). Standard Operating Procedures will be to keep one Final Clarifier off-line (on a rotating basis) at all times for regular maintenance.

The proposed two flow distribution point arrangement provides for proportional flow distribution to any variation of three (3) on-line Final Clarifier arrangements. Please see included flow schematics provided in Appendix C. Should the WPCF ever wish to operate all four (4) clarifiers at the same time (which should never be necessary), to obtain equal split between four (4) clarifiers the plant personnel would be required to block off a portion of the weirs and combine flows from the two splitter boxes into Final Clarifier No. 3. This scenario is also addressed within the flow schematics provided in Appendix C.

Future expansion of the plant will require the installation of a fourth VLR in the future. When this VLR is constructed, a fifth final clarifier will be required. Again, only 1 final clarifier will be required to operate at a time per each VLR and 1 unused final clarifier will be available to meet the Wastewater Facility Design Standards reliability requirements. As with the current improvements, the proposed two splitter box arrangement will allow for full and proportional flow split between the VLRs and on-line final clarifiers. Similar to the immediate improvements, should the WPCF choose to operate all five clarifiers at once (which would not be required) they would have to block off a portion of the weirs and combine flows from the two splitter boxes into Final Clarifier No. 3. The future VLR and Final Clarifier flow arrangements are provided in Appendix D.

The criteria for a waiver or variance of a rule are contained in Iowa Administrative Code 561-10.4:

"Upon petition of any person and at the sole discretion of the department, the department may issue a waiver or variance from the requirements of a rule is the director or the department in a contested case proceeding finds, based on clear and convincing evidence, all of the following:

10.4(1) The application of the rule would pose an undue hardship on the person for the waiver or variance is requested.

As stated previously, the construction of a stand-alone single splitter box to receive effluent from the three VLRs and distribute to the Final Clarifiers was evaluated and determined to be infeasible due to physical space limitations of the site and anticipated overall construction cost impact. It would be both a construction nightmare and very cost prohibitive to locate the required piping and structure to accomplish this flow split within the space available at the plant site. A site plan of this option is presented in Appendix B.

10.4(2) The waiver or variance from the requirements of a rule in the specific case would not prejudice the substantial legal rights of any person.

The proposed variance has no impact or prejudice to the substantial legal rights of any person.

10.4(3) The provisions of a rule subject to a petition for a waiver or variance are not specifically mandated by statue or another provision of law.

The provisions for the required "central collection and distribution point including proportional flow splitting shall be provided for the wastewater flows before each unit operation" is only found in the Iowa Wastewater Facilities Design Standards.

10.4(4) Substantially equal protection of public health, safety, and welfare will be afforded by a means other than that prescribed in the particular rule for which the waiver or variance is requested.

As described previously, the proposed two (2) separate flow distribution chambers provides equal and proportional flow split to on-line Final Clarifiers, which meets the intent of Design Standard 14.4.9.2. No reduction of treatment capacity, ability, or flexibility would occur with the approval of the variance.

10.9 (5) A history an any prior contacts between the department and the petitioner for the past five years, including a description of each affected permit held by the petitioner, and any notices of violation, Administrative Orders, contested case proceedings, and lawsuits involving the Department and the petitioner.

The City received an Administrative Order to install stand-by power to pump and treat average day demand for the City's potable water system. The City is currently implementing stand-by power at the necessary wells, treatment plant, and booster pump stations.

The City received notice from the Department in 2012 that it operated a diesel driven emergency generator, natural gas boilers, and waste gas flare at the water pollution control

facility without an approved air construction permit. The City applied for and received the air construction permit in 2012.

10.9 (6) *Any information known to the petitioner regarding the Departmtent's treatment of similar cases.*

No information is known to the petitioner regarding the Department's treatment of similar cases.

10.9 (7) *The name, address, and telephone number of any public agency or political subdivision of the state or federal government which also regulates the activity in question, or which might be affected by the granting of a waiver or variance.*

The petitioner states that no public agency or political subdivision of the state or federal government would be affected by granting a waiver or variance.

10.9 (8) *The name, address, and telephone number of any person or entity that would be adversely affected by the granting of a petition.*

The petitioner states that no person or entity would be adversely affected by the granting of the petition.

10.9 (9) *The name, address, and telephone number of any person with knowledge of relevant facts relating to the proposed waiver or variance.*

Mr. Michael F. Trotter, P.E. and L.S
McClure Engineering Company
705 First Avenue North
Fort Dodge, Iowa 50501
(515) 576-7155

Mr. Larry Bryant, P.E.
IDNR Wastewater Engineering Section
502 E. 9th Street
Des Moines, IA 50319-0034
(515) 281-6759

10.9 (10) *Signed releases authorizing persons with factual knowledge concerning the request to furnish the Department with information relevant to the waiver or variance. (Variances must be signed by the petitioner or authorized representative and a professional engineer licensed in Iowa preparing the engineering and technical justification of the petition.)*

See verification below,

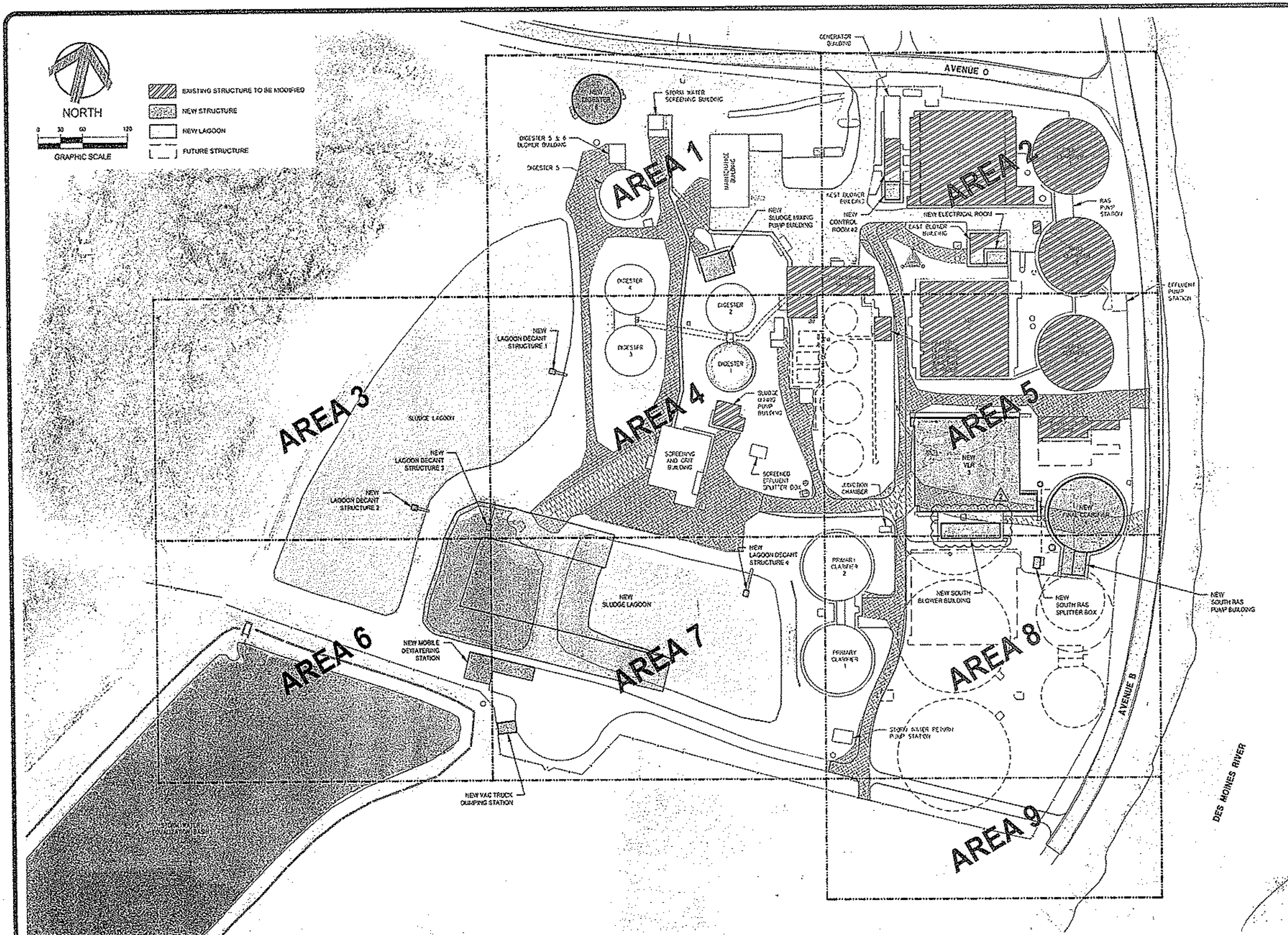
WHEREFORE, the Petitioner respectfully requests the department grant it a variance of a central collection and distribution point including proportional flow splitting shall be provided for the wastewater flows before each unit operation required by Iowa Wastewater Facilities Design Standards section 14.4.9.2 (Flexibility) so that the department may issue the pending construction permit, the application for which was submitted on ____, 2012.

Dated this 7 day of Nov, 2012.

Michael F. Trotter, P.E & L.S.
(P.E. No. 9806)
McClure Engineering Company
mtrotter@mecresults.com

Chad Schaeffer, P.E.
City Engineer
City of Fort Dodge, Iowa

APPENDIX A



McCLURE™ ENGINEERING Co.

building strong communities

205 First Avenue North
Fort Dodge, Iowa 50501
515-576-7155
fax 515-576-4235

PROPOSED
OVERALL FACILITIES
PLAN

WASTEWATER SYSTEM
IMPROVEMENTS 2013
PHASE D - SECTION 1
FORT DODGE, IOWA
FTD 1311016-04
SEPTEMBER 2012

REVISIONS
△ ADDENDUM 2

ENGINEER AKW	DRAWN BY CRH
CHECKED BY MPW	FIELD BOOK NO. -
DRAWING NO. SP-11A	SHEET NO. 31 / 190

APPENDIX B

APPENDIX B - EXHIBIT 1

5-WAY SPLITTER CHAMBER SITE PLAN

FORT DODGE, IOWA

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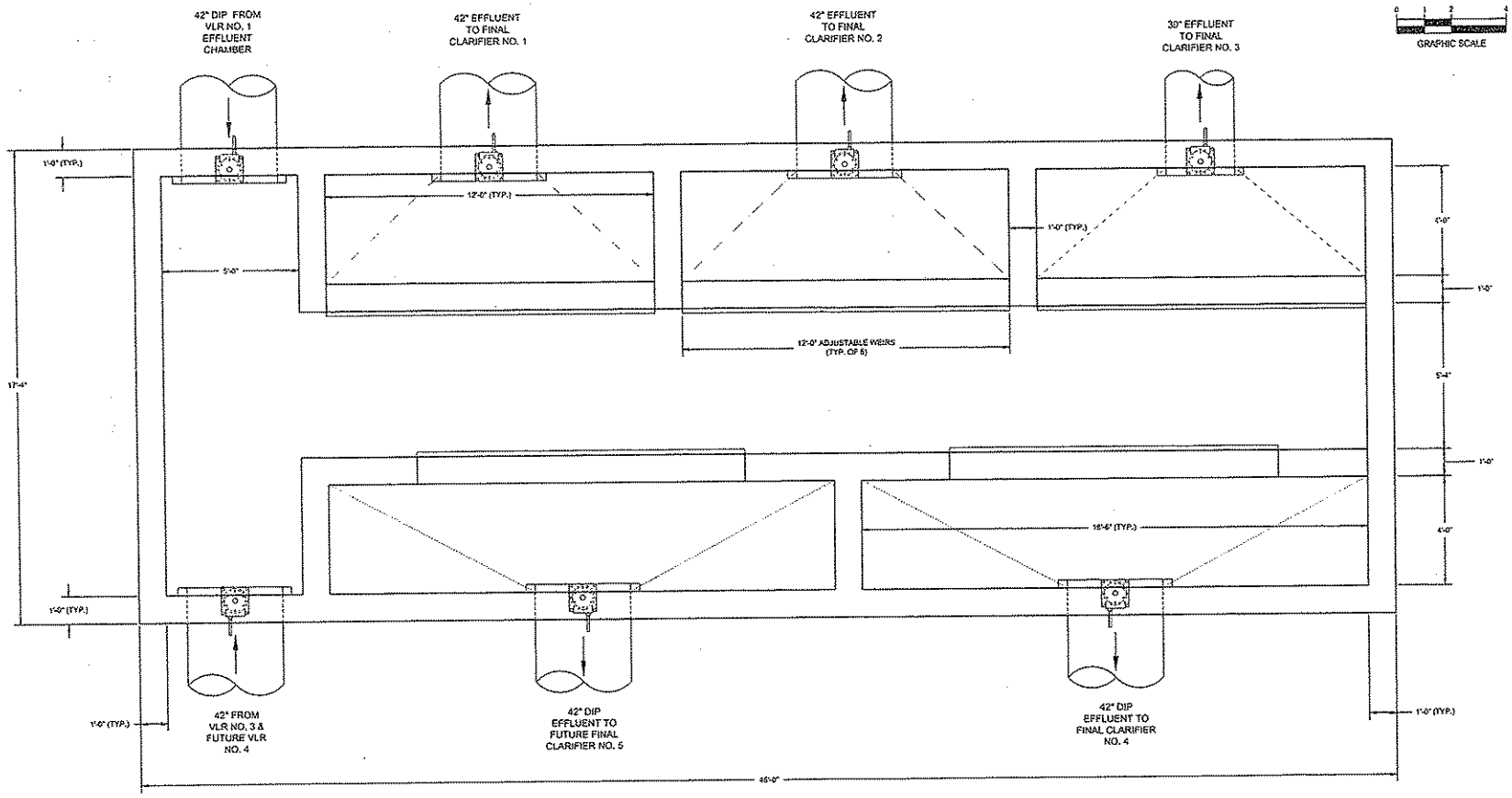
WASTEWATER SYSTEM IMPROVEMENTS 2011
PHASE D - SECTION 1
FTD 1311016-04
OCTOBER 2012

DRAWING NO. -
SHEET NO. - / -



5-WAY SPLITTER CHAMBER

SCALE: 1/2" = 1'-0"

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APPENDIX B - EXHIBIT 2

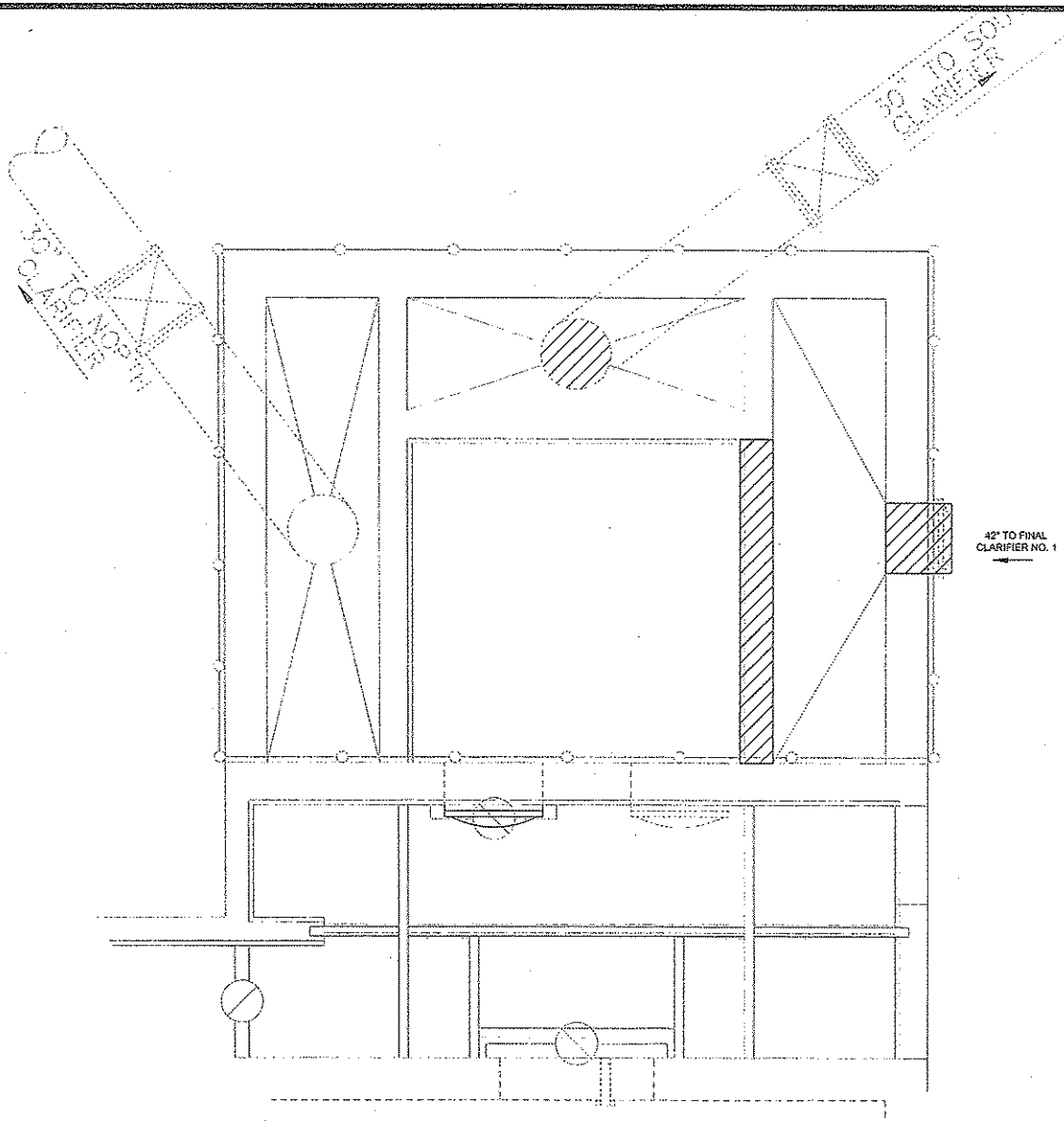
5-WAY SPLITTER CHAMBER

FORT DODGE, IOWA

WASTEWATER SYSTEM IMPROVEMENTS 2011
PHASE D - SECTION 1

FTD 1311016-04
OCTOBER 2012

DRAWING NO. -
SHEET NO. - / -



NORTH

0 1 2 4

GRAPHIC SCALE

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Fort Dodge, Iowa 50501
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APPENDIX B - EXHIBIT 3

VLR NO. 1 RENOVATIONS

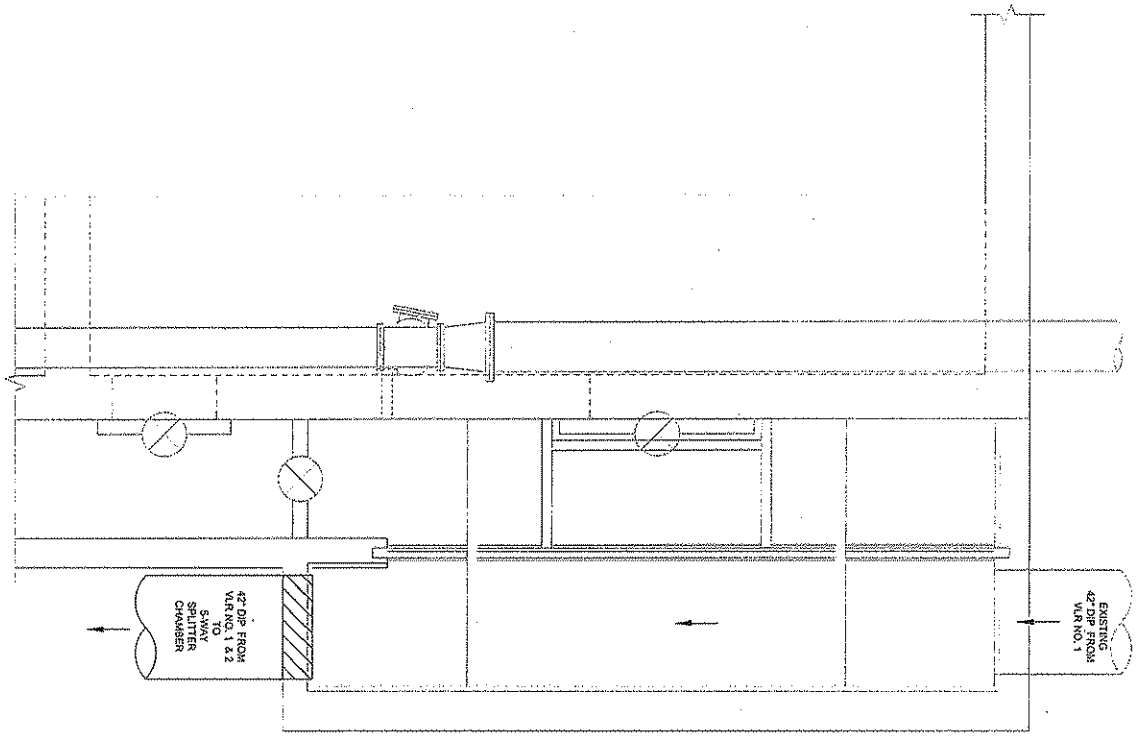
FORT DODGE, IOWA

WASTEWATER SYSTEM IMPROVEMENTS 2011
PHASE D - SECTION 1

FID 1311016-04
OCTOBER 2012

DRAWING NO. -

SHEET NO. - 1 -



NORTH

GRAPHIC SCALE 0 1 2 4

APPENDIX B - EXHIBIT 4

VLR NO. 2 RENOVATIONS

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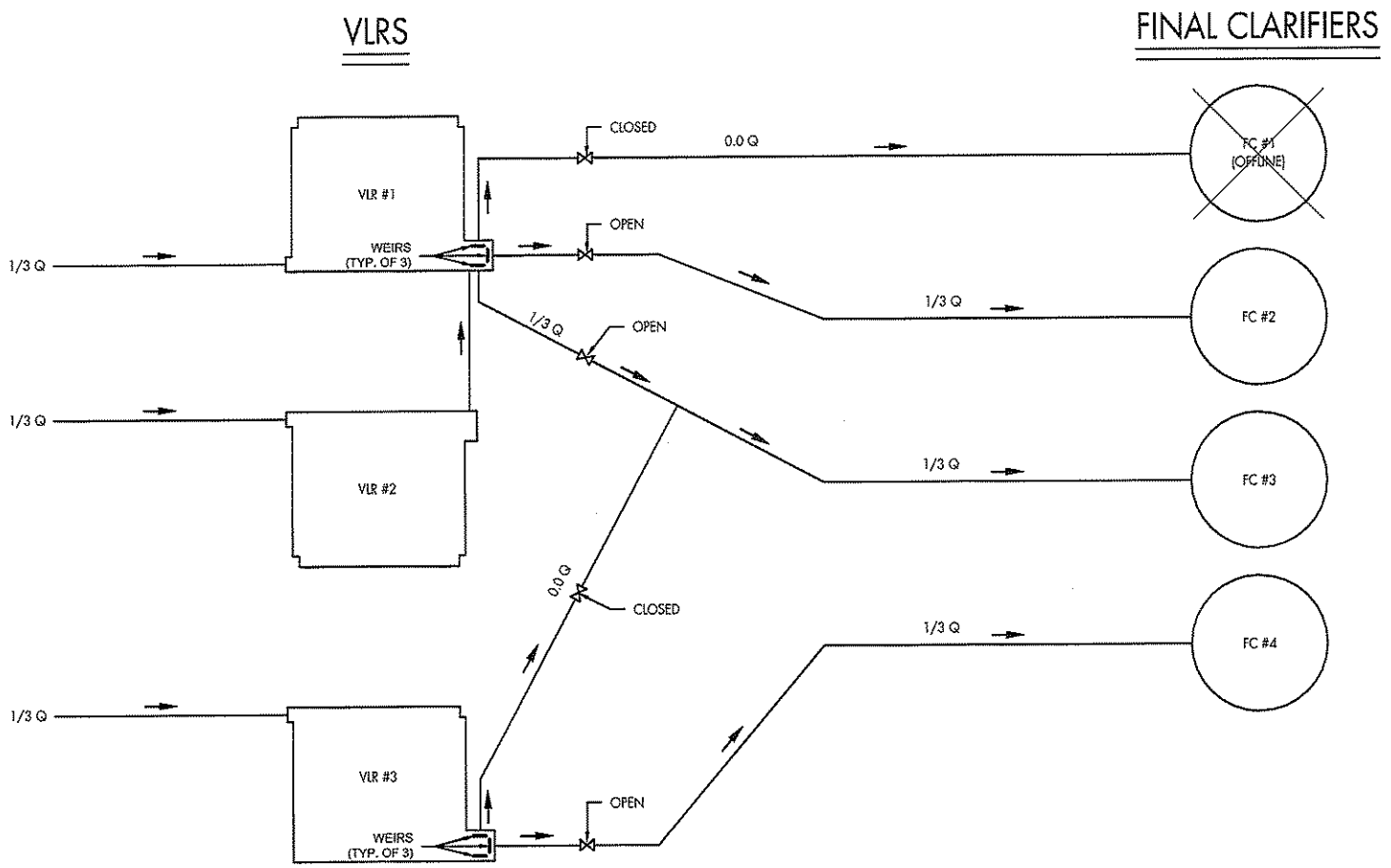
WASTEWATER SYSTEM IMPROVEMENTS 2011
PHASE D - SECTION 1
FID 1311016-04
OCTOBER 2012

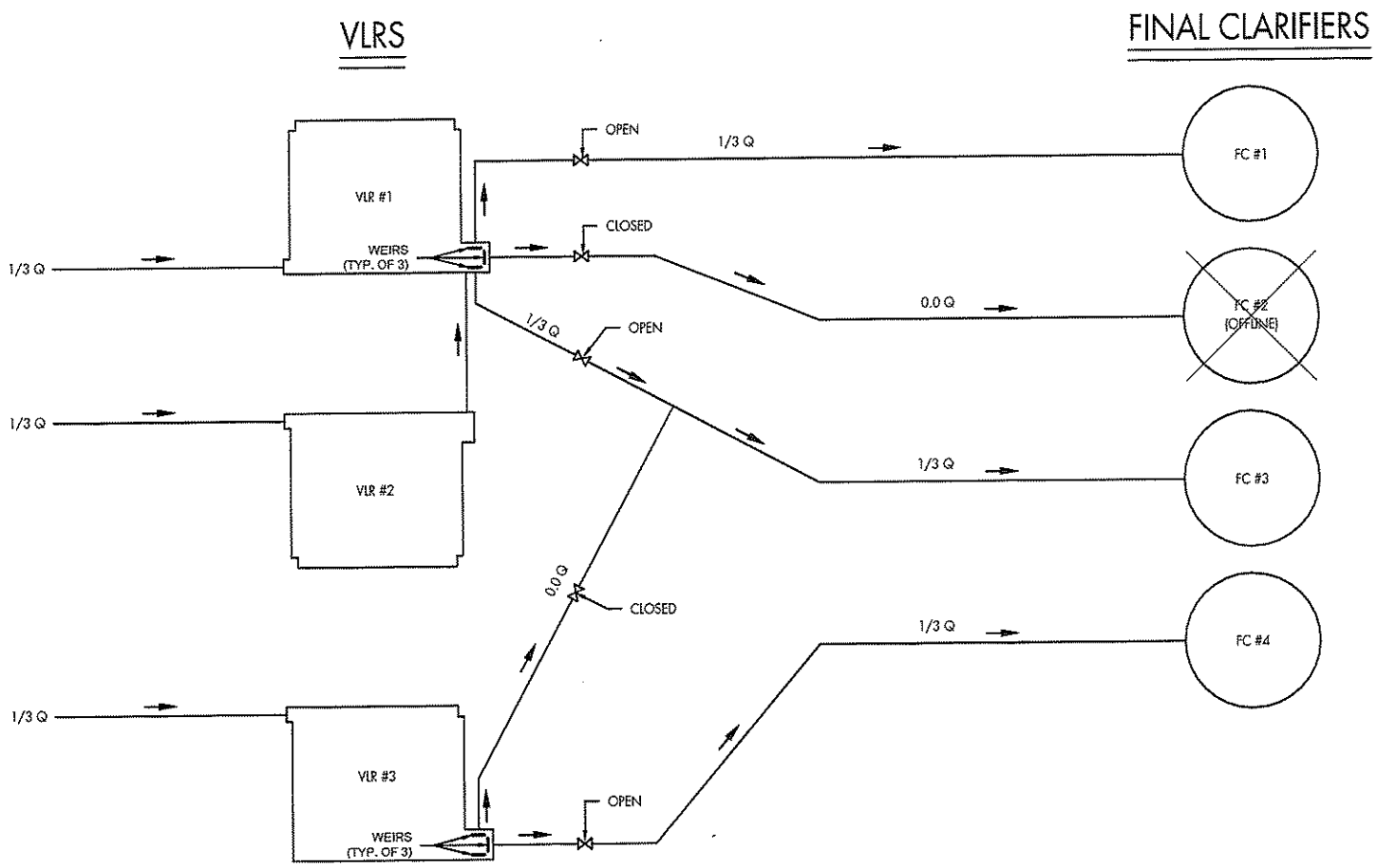
DRAWING NO. - SHEET NO. - / -

APPENDIX C



OPTION 1 - FINAL CLARIFIER #1 OFFLINE

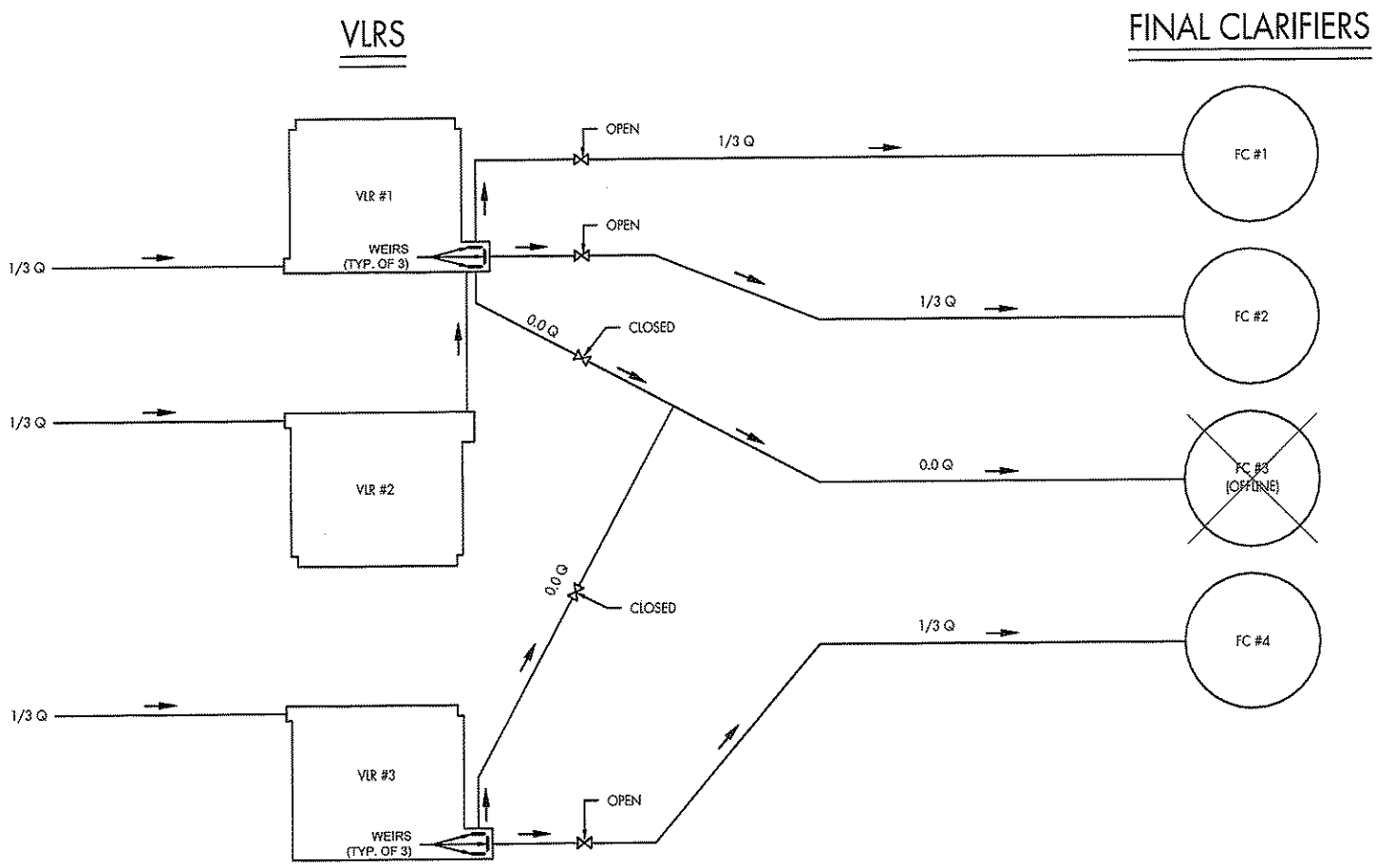
McCLURE ENGINEERING CO.



REPRESENTS SLUICE GATE AT WEIR BOX

OPTION 2 - FINAL CLARIFIER #2 OFFLINE

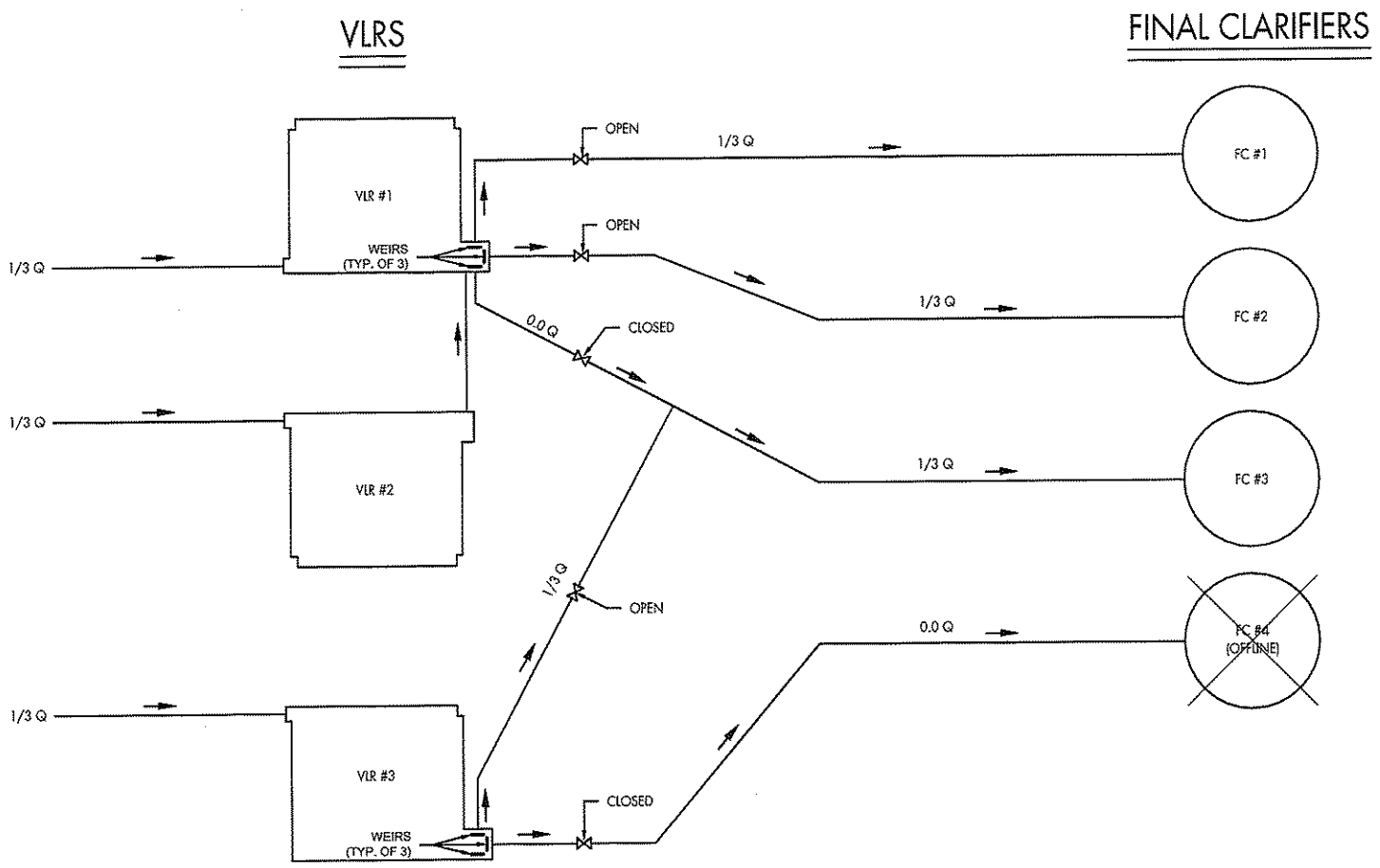
McCLURE ENGINEERING CO.



REPRESENTS SLUICE GATE AT WEIR BOX

OPTION 3 - FINAL CLARIFIER #3 OFFLINE

McCLURE ENGINEERING, CO.



REPRESENTS SLUICE GATE AT WEIR BOX

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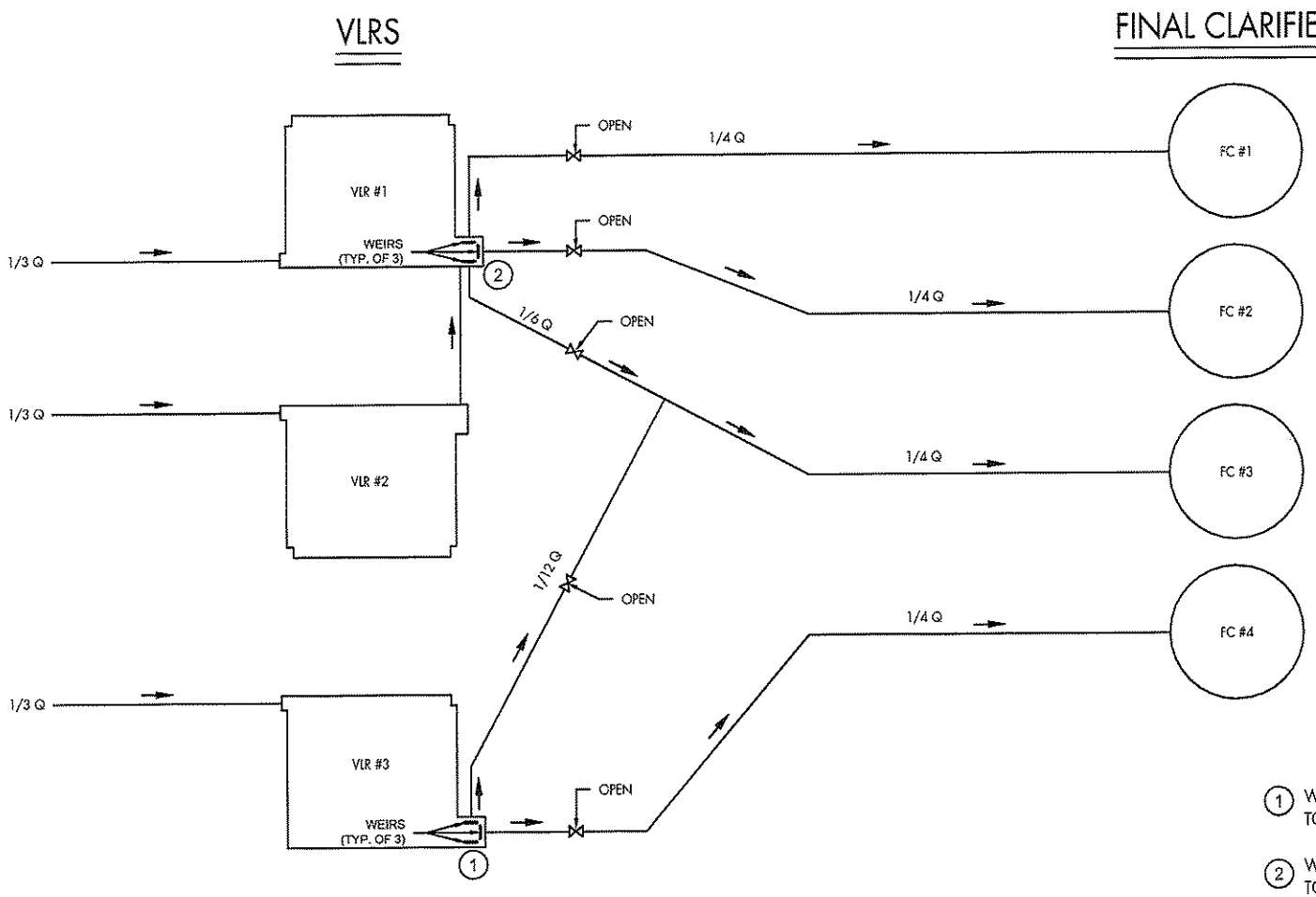
McCLURE ENGINEERING CO.



(1) WEIR ADJUSTED TO 1/3 NORMAL WIDTH TO PROVIDE DESIRED FLOW SPLIT

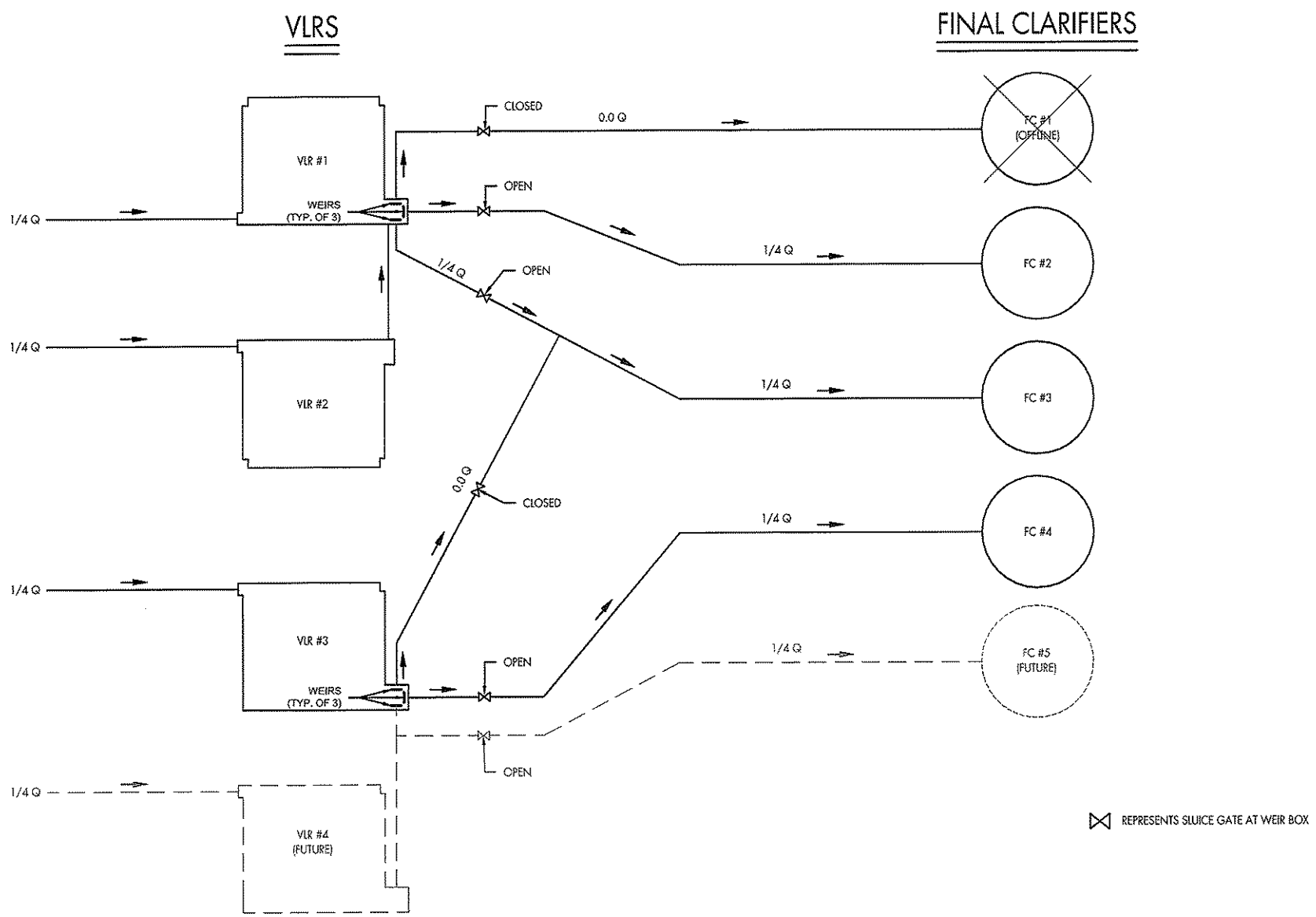
(2) WEIR ADJUSTED TO 2/3 NORMAL WIDTH TO PROVIDE DESIRED FLOW SPLIT

⋈ REPRESENTS SLUICE GATE AT WEIR BOX

OPTION 5 - ALL FINAL CLARIFIERS ONLINE

McCLURE ENGINEERING CO.

APPENDIX D



McCLURE ENGINEERING CO.

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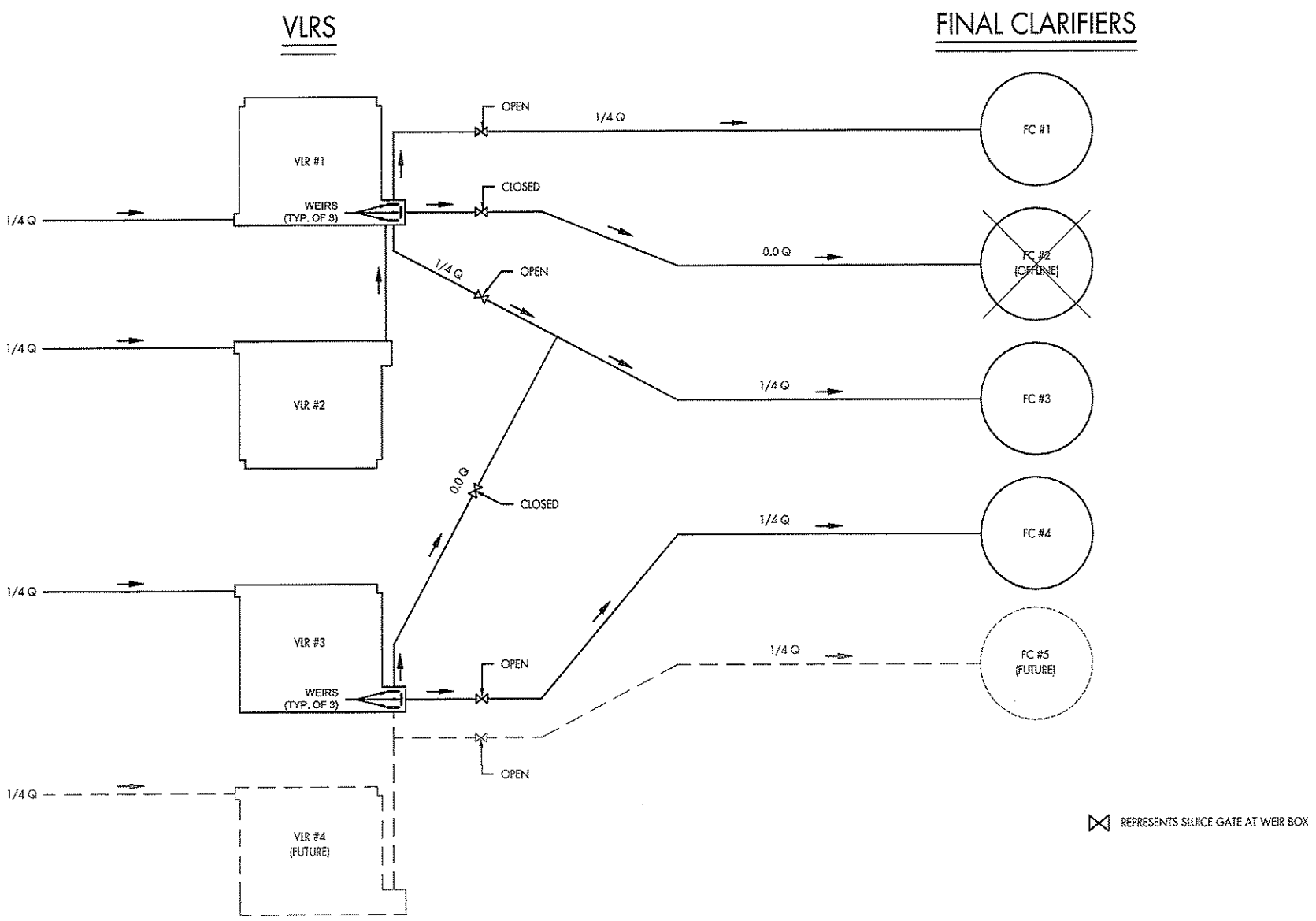

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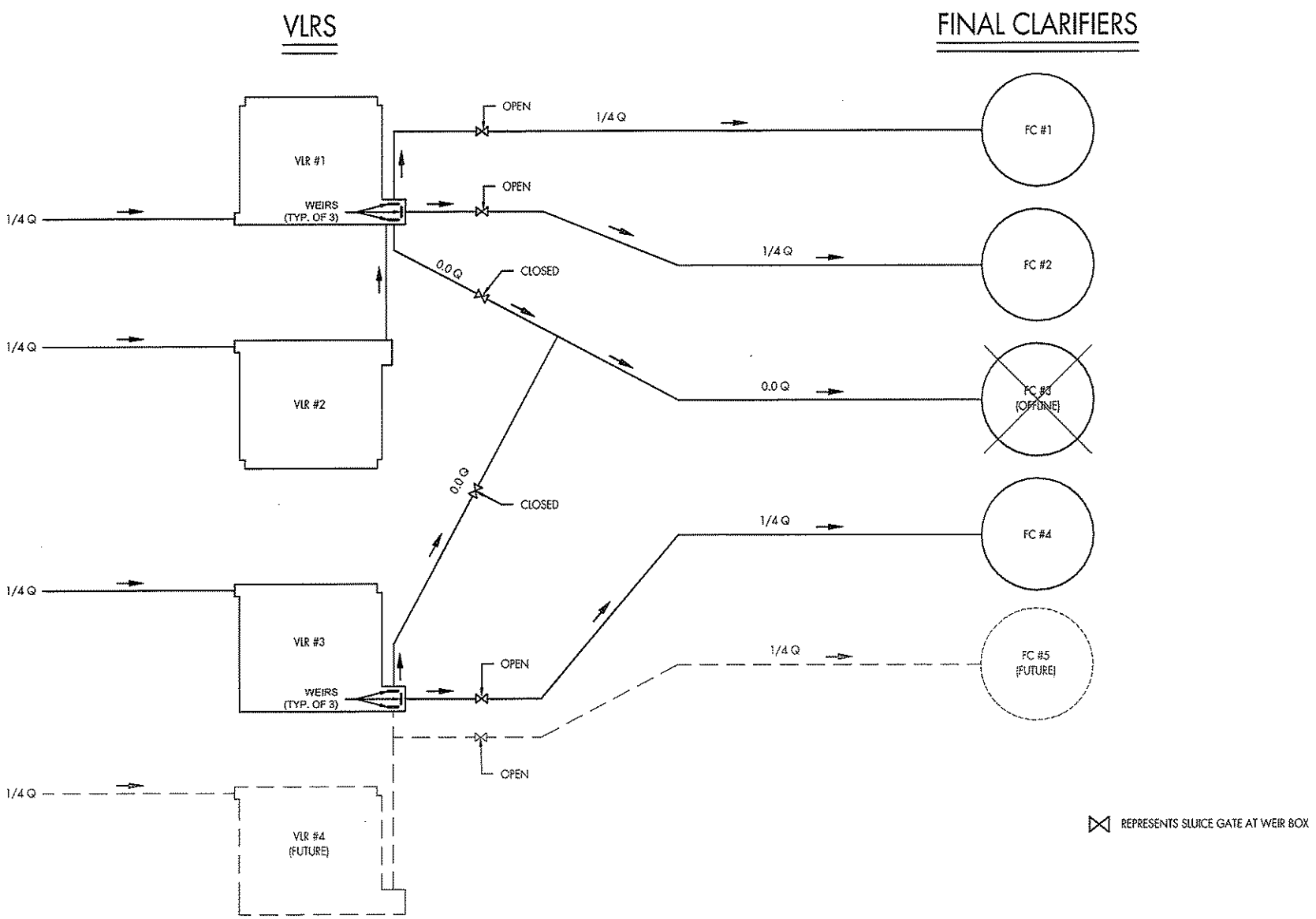
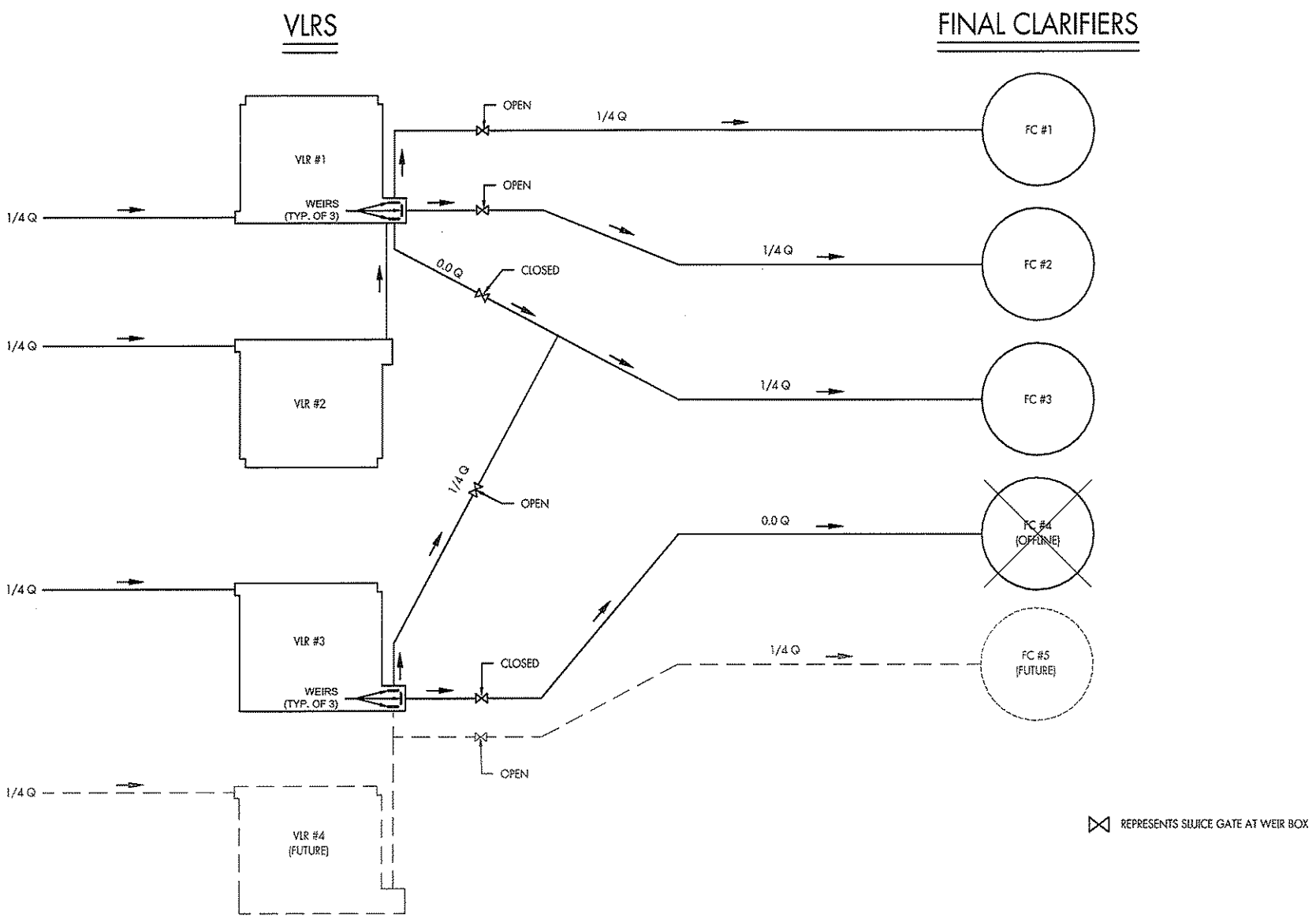
OPTION 2 - FINAL CLARIFIER #2 OFFLINE



McCLURE ENGINEERING CO.

OPTION 3 - FINAL CLARIFIER #3 OFFLINE



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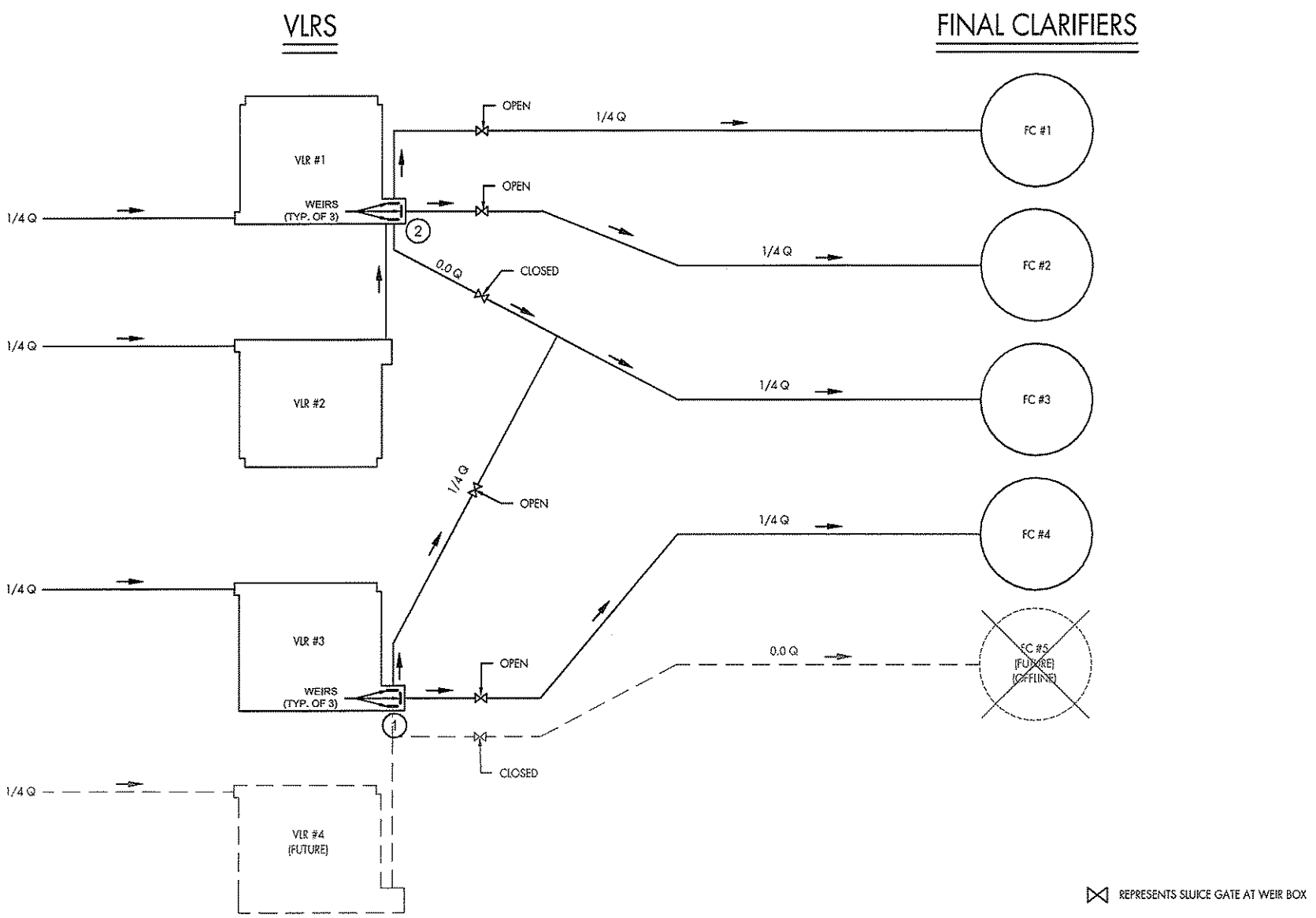
OPTION 4 - FINAL CLARIFIER #4 OFFLINE



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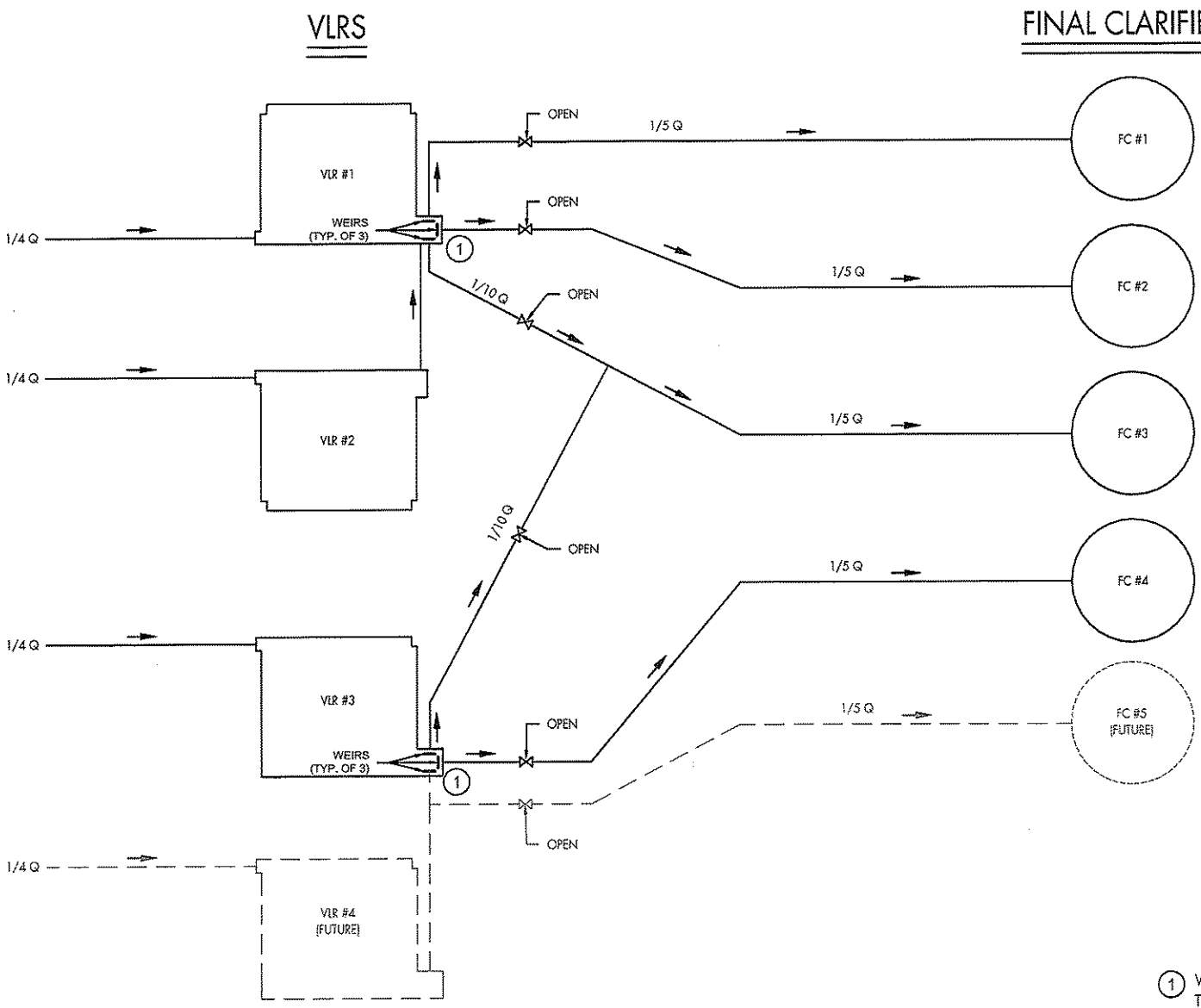

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OPTION 6 - ALL FINAL CLARIFIERS ONLINE