

13.10.4

VARIANCE REQUEST

Iowa Department of Natural Resources

1. Date : 1/2/91
2. Review Engineer : Fred Evans
3. Date Received : 12/12/90
4. Facility Name : Iowa Falls
5. County Number : 42
6. Program Area : CF
7. Facility Type : CO2
8. Subject Area : 314
9. Rule Reference : 64.2(9)
10. Design Std. Ref. : 13.10.4
11. Consulting Engr. : Chapsaddle - Garber Associates
12. Variance Rule : 64.2(9)C
13. Decision: Approved
Date: 1/7/91
14. Appeal:
Date:

15. Description of Variance Request

The City of Iowa Falls has submitted a construction permit application for improvements to three wastewater pump stations. Two pump stations serve small areas (3 Acres and 5 Acres); therefore, duplex submersible grinder pumps are proposed for installation in these two pump stations. The designing engineer proposes to use check valves which can be removed with the pumps; therefore, a variance has been requested to locate the check valves within the wet well in lieu of locating within a separate valve chamber

16. Consulting Engineer's Justification

1. Check valves shall be removable with the pump.
2. Provision of valve manholes would significantly increase cost, particularly the Custer Street Pump Station because of problems of accessibility of excavating equipment for such a manhole.

16. Consulting Engineer's Justification (cont.)

17. Department's Justification

It is recommended that a variance be granted to locate the check valves within the wet wells based upon the following considerations:

1. We have previously approved the location of check valves within the wet wells of submersible pump lift stations where such valves can be removed with the pump assembly for servicing without requiring entrance into the wet well. (see precedents below)
2. The new revision of the Ten States Standards will permit location of check valves in the wet wells of submersible pump lift stations if such valves are integral to the pump (see attached)

18. Precedents Used

City of Mount Vernon - Approved 6/2/89 - see attached letter
Best Inns, City of Johnston - Approved 7/13/90

19. Staff Reviewer

: Fred Evans

Date: 1/2/91

20. Supervisor

: [Signature]

Date: 1/2/91

21. Authorized by

: Daniel McAllister

Date: 1/8/91



TERRY E. BRANSTAD, GOVERNOR

RECORD COPY
File Name Iowa Falls - Sewage
Senders Initials BME

DEPARTMENT OF NATURAL RESOURCES
LARRY J. WILSON, DIRECTOR

January 11, 1991

Mr. Leslie S. Wolfe, P.E.
Clapsaddle-Garber Associates
2501 North Loop Drive
Ames, Iowa 50010

PROJECT NO.: S91-48
FILE: Iowa Falls
SUBJECT: Variance Request

Dear Mr. Wolfe:

The Iowa Department of Natural Resources in accordance with Subrule 567--64.2(9)c of the Iowa Administrative Code has approved your request for a variance from Iowa Wastewater Facilities Design Standard 13.10.4 which requires that check valves for submersible pumping stations be located in a separate valve chamber from the wet well. The granting of this variance will permit locating the check valves for the Custer Street and Forest Drive pump stations within the wet wells with the understanding that the check valves shall be removable with the pumps.

The engineering justification submitted substantially demonstrates that this variance for location of the check valves within the wet wells will result in at least equivalent effectiveness for access to the valves.

Sincerely,

DARRELL McALLISTER, BUREAU CHIEF
SURFACE & GROUNDWATER PROTECTION BUREAU

DM:FME:pla/WOLFE

cc: City Manager, Iowa Falls, IA
Field Office 2

IOWA DEPARTMENT OF NATURAL RESOURCES

***** TRANSMITTAL SLIP *****

Date

1/2/91

THE OFFICE OF:

Fred Evans

TO:

Wayne Farrant / Darrell McAllister
(Individual's Name)

REPLY FOR MY SIGNATURE

☐ NOTE AND FORWARD

REPLY DIRECT

☐ FILE

REVIEW, COMMENT AND RETURN

☐ FOR YOUR SIGNATURE

INVESTIGATE AND REPORT

☒ FOR YOUR APPROVAL

SEE ME

☐ PER YOUR REQUEST

FOR YOUR INFORMATION

☐ PER OUR CONVERSATION☐ TAKE ACTION BY

(Date)

COMMENTS:

have requested the designing engineer provide additional justification for proposed burying of the shut off valves outside of the pump station in lieu of providing a separate valve chamber as required by current wastewater design standards. We will take another look at the design and discuss with the operator at Iowa Falls before responding with either additional justification or provision of valve chambers.

Printed on
Recycled Paper

December 7, 1990

Mr. Fred Evans
IDNR - Wastewater Permits
Wallace State Office Building
900 E. Grand Ave.
Des Moines, Iowa 50319



CONSULTING ENGINEERS

David M. Fox, P.E.
James A. Merideth, P.E.
Leslie S. Wolfe, P.E.
Donn L Stone, P.E.
Scott L. Renaud, E.I.T.

RE: PLAN OF ACTION PUMP STATION IMPROVEMENTS
IOWA FALLS, IOWA CGA PN 2380.04

Dear Mr. Evans:

With reference to our telephone conversation, we have decided to increase the capacity of the grinder pump systems to 80 gpm in order to provide suitable velocity in the existing 4-inch force mains. Enclosed is a Revised Schedule E for each pump station and three (3) copies of the revised plans.

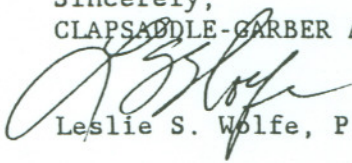
With respect to the grinder pumping systems, we are requesting a Variance to Sections 13.10.4 and 13.5.2 of the Iowa Wastewater Facilities Design Standards. As indicated in the specifications, check valves shall be removable with the pump. The decision to bury the shut off valves outside the structure was based on an IDNR Construction Permit No. 89-268-S for construction of a pumping station in Randall, Iowa, where burying shut off valves was permitted.

As can be seen on the plans, manholes for shut off valves would be constructed directly over VCP sewers with little or no separation. In essence, the sewers should be replaced significantly increasing cost, or the valve manhole should be located off the sewer line requiring the use of additional fittings.

The Custer Street Pump Station is located in a steep valley section behind closely spaced homes which have be constructed since installation of the facility. Access for even moderately sized excavating equipment would be very difficult requiring construction of temporary access and reconstruction of private lawn areas significantly increasing cost.

We request that the Variance be granted allowing construction as shown on the revised plans. If you have any questions or if additional information is needed, contact Francis Janssen, Superintendent (515/648-3714) or myself at the CGA-Ames office.

Sincerely,
CLAPSADDLE-GARBER ASSOCIATES, INC.


Leslie S. Wolfe, P.E.

Encl.

cc: Francis Janssen, Superintendent

CLAPSADDLE-GARBER ASSOCIATES

Wayne R. Moore Technology Transfer Center • Iowa State University Research Park
2501 North Loop Drive • Ames, Iowa 50010 • Telephone 515/296-7750 • Fax 515/296-7740
Iowa WATS 800-542-7981 • U.S. WATS 800-634-5463

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WATER QUALITY

CONSTRUCTION PERMIT APPLICATION

PROGRAM

SCHEDULE E, WASTEWATER PUMP STATION

WAWM USE

DATE PREPARED

PROJECT IDENTITY

PROJECT NO.

11-5-90

Plan of Action Pumping Station Improvements

DATE REVISED

Custer Street Pump Station

PERMIT NO.

12-7-90

1.

Design Basis	Initial	Design Year (Ultimate)
Residential Area, Acres		3±
Population, Persons		44±
PHDW Flow, MGD		0.018
Industrial Area, Acres		0
PHDW Flow, MGD		0
Other _____, Acres		0
PHDW Flow, MGD		0
Peak Hourly Infiltration, MGD		0.004
Peak Hourly Inflow, MGD		0.003
Total PHDW Flow, MGD		0.018
Total PHW Flow, MGD		0.025

2. Provide pump information

Pump No.	Type	Opening (in)	HP	Capacity GPM	TDH (ft.)		Operating Level	
					Computed	Rated	On	Off
No. 1	Grinder	N/A	5	80	29.5	48	2.0	1.0
No. 2	Grinder	N/A	5	80	29.5	48	2.5	1.0
No. 3								
No. 4								
No. 5								
Sump								

Are pumps specified as being capable of passing 3 in. diameter spheres? Yes ☐ No ☒Can remaining pumps handle PHW flow with largest pump out of service? Yes ☒ No ☐3. Wet-well effective volume 330 gallons. Retention time: Initial Flow N/A minutes. Design Flow: 54 minutes. @ AWW = 6 gpm4. Is forced air ventilation provided? ☒ yesContinuous: wet-well ☐ dry-well ☐ Intermittent: wet-well ☒ dry-well ☐
wet-well ☐ air changes/hour dry-well N/A air changes/hourAre spark-proof materials specified? Yes ☐ No ☒5. Force main: Is profile of force main provided? Yes ☐ No ☒ (existing)Size 4 in. Length 125± ft.Pipe Material CIP Joint Push-OnMinimum cover 5± ft. Minimum velocity 0.46 fpsNumber of high points 1 Are air relief valves provided? Yes ☐ No ☒Number of thrust blocks provided? ☒ yes At location(s) unknownIs pressure test specified? Yes ☐ No ☒ Does installation conform to AWWA C600?Yes ☐ No ☐ If no, explain unknown6. Are valves provided on the suction & discharge lines? Yes ☐ No ☒Type: Discharge Check & ball valves Suction none7. Is an alarm system provided? Yes ☒ No ☐ Type radioIndicate where audio/visual warning signals will be located Public Works Radio Band8. Method of pump control wet well water level9. Are the pumps protected from clogging? Yes ☒ No ☐Method of cleaning manualMethod of pump removal manual Are lifting hooks/arms provided? ☐ no10. Are permanent emergency piping bypass connections provided? ☐ no Is an emergency power supply available? ☒ yes Describe station operation in an emergency (equipment, piping, bypass, etc.)Alarm indicates high-low level or pump failures. Transfer switch & generator receptable11. Is the wastewater pump station located in a flood plain? Yes ☐ No ☒ Elevation of 100 year provided. flood (MSL) Elevation of 25 year flood (MSL)

WATER QUALITY PROGRAM		CONSTRUCTION PERMIT APPLICATION SCHEDULE E, WASTEWATER PUMP STATION		WAWM USE	
DATE PREPARED 11-5-90		PROJECT IDENTITY Plan of Action Pumping Station Improvements Forest Drive Pump Station		PROJECT NO.	
DATE REVISED 12-7-90				PERMIT NO.	

1. Design Basis Initial Design Year (Ultimate)

Residential Area, Acres		5±
Population, Persons		64±
PHDW Flow, MGD		0.0256
Industrial Area, Acres		0
PHDW Flow, MGD		0
Other _____, Acres		0
PHDW Flow, MGD		0
Peak Hourly Infiltration, MGD		0.008
Peak Hourly Inflow, MGD		0.012
Total PHDW Flow, MGD		0.0256
Total PHMW Flow, MGD		0.0456

2. Provide pump information

Pump No.	Type	Opening (in)	HP	Capacity GPM	TDH (ft.)		Operating Level	
					Computed	Rated	On	Off
No. 1	Grinder	N/A	5	80	46.5	60	2.0	1.0
No. 2	Grinder	N/A	5	80	46.5	60	2.5	1.0
No. 3								
No. 4								
No. 5								
Sump								

Are pumps specified as being capable of passing 3 in. diameter spheres? Yes ☐ No ☒Can remaining pumps handle PHMW flow with largest pump out of service? Yes ☒ No ☐5. Wet-well effective volume 350 gallons. Retention time: Initial Flow n/a minutes. Design Flow: 35 minutes. @ AWW = 10 gpm4. Is forced air ventilation provided? YesContinuous: wet-well ☐ dry-well ☐ Intermittent: wet-well yes dry-well ☐
wet-well ☐ air changes/hour dry-well N/A air changes/hourAre spark-proof materials specified? Yes ☐ No ☒5. Force main: Is profile of force main provided? Yes ☐ No ☒ (existing)Size 4 in. Length 500± ft.Pipe Material CIP Joint push-onMinimum cover 5± ft. Minimum velocity 0.82 fpsNumber of high points 1 Are air relief valves provided? Yes ☐ No ☒Number of thrust blocks provided? yes At location(s) unknownIs pressure test specified? Yes ☐ No ☒ Does installation conform to AWWA C600?Yes ☐ No ☐ If no, explain unknown5. Are valves provided on the suction & discharge lines? Yes ☐ No ☒Type: Discharge check & ball valve Suction none7. Is an alarm system provided? Yes ☒ No ☐ Type radioIndicate where audio/visual warning signals will be located Radio Public Works Band8. Method of pump control wet well water level9. Are the pumps protected from clogging? Yes ☒ No ☐Method of cleaning manualMethod of pump removal manual Are lifting hooks/arms provided? no0. Are permanent emergency piping bypass connections provided? no Is an emergency power supply available? yes Describe station operation in an emergency (equipment, piping, bypass, etc.)Alarm indicates high-low level or pump failures. Transfer switch & generator Receptacle:1. Is the wastewater pump station located in a flood plain? Yes ☐ No ☒ Elevation of 100 year flood (MSL) provided.

Elevation of 25 year flood (MSL) _____



TERRY E. BRANSTAD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
LARRY J. WILSON, DIRECTOR

July 13, 1990

Bishop Engineering Company, Inc.
3501 104th Street
Des Moines, IA 50322

ATTENTION: Charles J. Bishop, P.E.

SUBJECT: Request for a Variance
Interim Pumping Station for Best Inns
Johnston, Iowa

Gentlemen:

The Iowa Department of Natural Resources in accordance with subrule 567--64.2(9)c of the Iowa Administrative Code has approved your request for a variance from Iowa Wastewater Facilities Design Standard 13.10.4. This design standard requires that the check valves and shutoff valves for submersible pumping stations be located in a separate valve chamber. The approval of this variance request will permit the location of these valves in the pumping station wet well as proposed by your firm.

The engineering justification submitted substantially demonstrates that this variance will result in at least equivalent effectiveness during the interim operating period while significantly reducing costs.

Sincerely,

DARRELL MCALLISTER
BUREAU CHIEF
SURFACE AND GROUNDWATER PROTECTION BUREAU

DM:bkp/S&GW193P07.01

cc: Field Office 5



TERRY E. BRANSTAD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES

LARRY J. WILSON, DIRECTOR

June 2, 1989

Mr. Christopher M. Stephan
MMS Consultants, Inc.
465 Iowa Highway No. 1 West
Iowa City, Iowa 52246

RE: Oak Ridge Estates, Part One
Mount Vernon, Iowa

Dear Mr. Stephan:

We have completed our review of the variance request of May 17, 1989 in regards to Chapter 13.10.4 of the Iowa Wastewater Facilities Design Standards. Our design standards require that valves for submersible pumps shall be located in a separate valve chamber while you are proposing to locate check valves in the wet well and to bury a gate valve and a valve box adjacent to the wet well.

We could allow the check valves to be located in the wet well since it is specifically designed as a component of the submersible pump which can be lifted out with the pump for servicing. We would, however, still require a separate valve chamber be provided for the gate valves to prevent the need of digging valves out for maintenance. Your request of burying a gate valve and a valve box adjacent to the wet well has been denied.

If you have any questions concerning this letter, please do not hesitate to contact Mr. Billy C. Chen of this office at 515/281-4305.

Sincerely,

DARRELL McALLISTER, CHIEF
SURFACE & GROUNDWATER PROTECTION BUREAU

DM:BCC:pla/STEP

cc: Field Office 6
V.G. Stoner & Sons Corp.

43.12 Vacuum-priming Pumps

Vacuum-priming pump stations shall be equipped with dual vacuum pumps capable of automatically and completely removing air from the suction lift pump. The vacuum pumps shall be adequately protected from damage due to wastewater. The combined total of dynamic suction lift at the "pump off" elevation and required net positive suction head at design operating conditions shall not exceed 22 feet.

43.2 Equipment, Wet Well Access and Valving Location

The pump equipment compartment shall be above grade or offset and shall be effectively isolated from the wet well to prevent the humid and corrosive sewer atmosphere from entering the equipment compartment. Wet well access shall not be through the equipment compartment. Valving shall not be located in the wet well.

44 Submersible Pump Stations - Special Considerations

Submersible pump stations shall meet the applicable requirements under Section 42, except as modified in this Section.

44.1 Construction

Submersible pumps and motors shall be designed specifically for raw wastewater use, including totally submerged operation during a portion of each pumping cycle and shall meet the requirements of National Electrical Code for such units. An effective method to detect shaft seal failure or potential seal failure shall be provided.

44.2 Pump Removal

Submersible pumps shall be readily removable and replaceable without dewatering the wet well or disconnecting any piping in the wet well.

44.3 Electrical

44.31 Power Supply and Control

Electrical supply, control and alarm circuits shall be designed to provide strain relief and to allow disconnection from outside the wet well. Terminals and connectors shall be protected from corrosion by location outside the wet well or through use of watertight seals. If located outside, weatherproof equipment shall be used.

44.32 Controls

The motor control center shall be located outside the wet well, readily accessible, and be protected by conduit seal or other appropriate measures meeting the requirements of the National Electrical Code, to prevent the atmosphere of the wet well from gaining access to the control center. The seal shall be so located that the motor may be removed and electrically disconnected without disturbing the seal.

44.33 Power Cord

Pump motor power cords shall be designed for flexibility and serviceability under conditions of extra hard usage and shall meet the requirements of the National Electrical Code standards for flexible cords in wastewater pump stations. Ground fault interruption protection shall be used to de-energize the circuit in the event of any failure in the electrical integrity of the cable. Power cord terminal fittings shall be corrosion-resistant and constructed in a manner to prevent the entry of moisture into the cable, shall be provided with strain relief appurtenances, and shall be designed to facilitate field connecting.

44.4 Valves

Valves required under paragraph 42.5 shall be located in a separate valve pit. Valve pits may be dewatered to a wet well through a valved drain line. Check valves that are integral to the pump need not be located in a separate valve pit provided that the valve can be removed from the wet well in accordance with paragraph 44.2.

45 Alarm Systems

Alarm systems shall be provided for pumping stations. The alarm shall be activated in cases of power failure, sump pump failure, pump failure, unauthorized entry, or any cause of pump station malfunction. Pumping station alarms shall be telemetered to a municipal facility that is manned 24 hours a day. If such a facility is not available and a 24-hour holding capacity is not provided, the alarm shall be telemetered to city offices during normal working hours and to the home of the person(s) in responsible charge of the lift station during off-duty hours. Audio-visual alarm systems with a self-contained power supply may be acceptable in some cases in lieu of the telemetering system outlined above, depending upon location, station holding capacity and inspection frequency.

46 Emergency Operation

46.1 Objective

The objective of emergency operation is to prevent the discharge of raw or partially treated wastewater to any waters and to protect