15.4.3

9-8-06

VARIANCE REQUEST

Iowa Department of Natural Resources

1. Date	: 12/15/97	13. Decision:	Approved
2. Review Engineer	: Terry Kirschenman	Date:	12/16/97
3. Date Received	: 9-11-97		
4. Facility Name	: Mount Pleasant	14. Appeal:	
5. County Number	: 44	Date:	
6. Program Area	: CP		
7. Facility Type	: COS		
8. Subject Area	: 330		
9. Rule Reference	: 64.2(9) a		
10. Design Std. Ref.	: 15.4.3		
11. Consulting Engr.	: French Reneker		
12. Variance Rule	: 64.2(9) c		

15. Description of Variance Request

Install one grit removal unit sized at 4 mgd in new headworks rather than two grit removal units each sized at 4 mgd or three units each sized at 2 mgd.

16. Consulting Engineer's Justification

Vortex grit removal is extremely reliable

Added expense of having two is not worth the extra cost.

Both units cannot be operated simultaneously

Bill G.

STATE OF IOWA

TERRY E. BRANSTAD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
LARRY J. WILSON, DIRECTOR

December 15, 1997

The Honorable Stan Hill
Mayor of Mount Pleasant
220 West Monroe
Mount Pleasant, Iowa 52641

RE: Wastewater Treatment, Grit Removal Facilities
Mount Pleasant, Iowa
CS192118 01

Dear Mayor Hill:

The Iowa Department of Natural Resources received the November 4, 1997, correspondence from French Reneker Associates, Inc. Their letter was in response to our October 24, 1997, comment letter. Your request for a variance from the reliability requirements of Design Standard 15.4.3 is approved on the following conditions:

1. No treatment removal credit shall be given to the fine screens in the design of this project.

2. Space must be included in the headworks for the addition of a second 4.0 mgd grit removal unit. This grit removal unit shall be added if deemed necessary for reliable and effective operations.

3. Hydraulic safeguards to assure that the headworks building will not be flooded shall be included in the project should the fine screens fail in the interim.

Should you have any questions, please contact Terry L. Kirschenman at 515-281-8885.

Sincerely,

Darrell McAllister
Bureau Chief
Water Quality Bureau

cc: French Reneker Associates, Inc., Fairfield
Field Office 6

FRENCH - RENEKER - ASSOCIATES, Inc.

Donald E. French (1921-1982)
W. Daniel Reneker, PE (retired)
1501 S. MAIN STREET PO BOX 135 FAIRFIELD, IOWA 52556 515-472-5145 Fax 515-472-2653

Kenneth D. Bucklin, PE-LS • Jerry W. Long, PE • David H. Fredericks, PE • Kent O. Rice, PE
Stephen W. Hausner, PE-LS • John W. Meyer, PE

CONSULTING ENGINEERS

November 4, 1997

Mr. Terry Kirschenman
Iowa Department of Natural Resources
Wallace State Building
900 East Grand
Des Moines, Iowa 50319

Re: Wastewater Treatment Plant - Grit Removal Facilities
Mt. Pleasant, Iowa

Dear Terry:

This letter is to confirm the conditions outlined in the correspondence from Darrell McAllister dated October 24, 1997 to Mayor Stan Hill concerning our variance request relating to the grit removal units. That letter listed three conditions for the approval of the fine screening concept with a single grit removal unit. The conditions given in Mr. McAllister's letter (**bold**) and our responses are as follows:

1. **No treatment removal credit shall be given to the fine screens in the design of this project.**
   Response: We concur. The design of the other process units will be made accordingly.

2. **Space must be included in the headworks for the addition of a second or a third grit removal unit if a single 4.0 mgd unit or two, 2.0 mgd units are selected, respectively. Another grit removal unit for these applications shall be added if deemed necessary for reliable and effective operations.**
   Response: A single 4.0 mgd unit will be provided. Space will be allowed within the building to add a second 4.0 mgd unit.

3. **Hydraulic safeguards shall be included in the project should the fine screens fail in the interim.**
   Response: Two fine screen units, each capable of handling the 4.0 mgd design flow will be provided. Hydraulic safeguards will be provided to assure that the headworks building will not be flooded. These will be submitted with the final designs.

Thank you for your prompt response on this issue. Should you have any questions, please contact me.

Very truly yours,
FRENCH-RENEKER-ASSOCIATES,INC.

John W. Meyer

John W. Meyer, PE
Project Engineer

JWM/tlb
cc: Brent Schleisman

KIRSCH3

Mount Pleasant 01 SRF
TLK

STATE OF IOWA

TERRY E. BRANSTAD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
LARRY J. WILSON, DIRECTOR

October 24, 1997

The Honorable Stan Hill
Mayor of Mount Pleasant
220 West Monroe
Mount Pleasant, Iowa 52641

RE: Wastewater Treatment, Grit Removal Facilities
Mount Pleasant, Iowa
CS192118 01

Dear Mayor Hill:

The September 11, 1997, correspondence to the Department from French Reneker Associates requests a variance from the Iowa Wastewater Facilities Design Standards requirement of reliability for grit removal preceding fine screens. This letter provides comments and suggestions regarding the request and identifies conditions under which a variance could be approved.

Design Standard 15.4.3 states the following: "Plants treating wastes from combined sewers and plants utilizing fine screens shall have at least two mechanically cleaned grit removal units, with provisions for bypassing. Adequate capacity for the MWW flow shall be provided with the largest unit of service." A single grit removal unit sized for 4.0 mgd is requested by French Reneker rather than two units at 4.0 mgd. According to French Reneker, meeting the state's design standards for processing the MWW with one unit out of service is not worth the added expense because the grit will pass on to the SBR aeration tanks where it may collect. Operating constraints may prevent two grit removal units each sized at 4.0 mgd from operating simultaneously. Your consultant suggests the design standard may be inappropriate for the type of grit removal equipment currently proposed.

The Department, under Subrule 64.2(9) of the Iowa Administrative Code, may approve variances from the design standards and siting criteria which provide in the judgement of the Department for substantially equivalent or improved effectiveness where there are unique circumstances not found in most projects. In reviewing a variance request, the Department may consider the unique circumstances of the project, direct or indirect environmental impacts, the durability and reliability of the alternative, and the purpose and intent of the rule or standard in question. It must be reasonably clear that the condition and circumstances which were considered in the adoption of the rule or standard for the project in question and therefore the effective purpose of the rule will not be compromised if a variance is granted.

Grit removal minimizes the potential for adverse flow restrictions due to retained solids and gummy materials on the fine screens. Design Standard 15.2.5.2.3 states that continuously operated fine screens shall be preceded by a bar screen, by grit removal facilities and by facilities for the removal of floatable oils and grease. We agree with your engineer that grit removal must be operable at flows less than the 4.0 mgd MWW, however, equalization of actual system peaks will cause the 4.0 mgd flow to occur for longer durations than a plant's MWW flow without equalization. An option providing three units each sized at 2.0 mgd would meet the standard. There may be other acceptable grit removal systems available if the vortex type do not have the operational flexibility desired by the City. Another issue is the ability to expand this plant easily if the design peak hour must be revised to accommodate the 6.15 mgd MWW flow existing in the collection system.

The significance of the design standard is the requirement for grit removal prior to a fine screen process (15.2.5.2.3). Then, more specifically, the minimum of at least two units with firm capacity at MWW (15.4.3). The key here is obviously the fine screen process. The Department will approve the fine screening concept with one grit removal unit sized at 4.0 or two units each sized at 2.0 mgd under the following conditions:

1. No treatment removal credit shall be given to the fine screens in the design of this project.
2. Space must be included in the headworks for the addition of a second or third grit removal unit if a single 4.0 mgd unit or two 2.0 mgd units are selected, respectively. Another grit removal unit for these applications shall be added if deemed necessary for reliable and effective operations.
3. Hydraulic safeguards shall be included in the project should the fine screens fail in the interim.

Should you have any questions, please contact Terry L. Kirschenman at 515-281-8886.

Sincerely,

Darrell McAllister
Bureau Chief
Water Quality Bureau

cc: French Reneker Associates, Inc, Fairfield
Field Office 6

FRENCH - RENEKER - ASSOCIATES, Inc.

Donald E. French (1921-1982)
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CONSULTING ENGINEERS

Kenneth D. Bucklin, PE-LS • Jerry W. Long, PE • David H. Fredericks, PE • Kent O. Rice, PE
Stephen W. Hausner, PE-LS • John W. Meyer, PE

September 11, 1997

Mr. Terry Kirschenman
Iowa Department of Natural Resources
Wallace State Building
900 East Grand
Des Moines, Iowa 50319

Re: Mt. Pleasant WWTP
Request for variance concerning grit removal facilities

Dear Terry:

We are requesting a variance to the IDNR Design Chapter 15.4.3 concerning the grit removal design for the Mt. Pleasant Wastewater Treatment Plant. As you know, we will be incorporating fine screens into the Mt. Pleasant Plant. This reference section of the design chapters requires that two mechanically cleaned grit removal units with provisions for bypassing must be used ahead of fine screens. In addition, each of the two grit removal units must be able to handle the maximum wet weather flow. With the equalization basin ahead of the Mt. Pleasant Treatment Plant, the maximum wet weather flow into the treatment plant is 4.0 mgd.

Vortex style grit removal is planned for Mt. Pleasant rather than channel type. Vortex style units fit the headworks building much better particularly since we are pumping to the treatment plant. Either a mechanical paddle wheel or air lift pump style rotational assist device will be incorporated. We have reviewed with the manufactures of grit removal units that do not incorporate these devices about their applicability to our system. It has been determined that the requirements of this style grit removal units will not function properly with our operating parameters.

Our variance request is for allowing one grit removal unit capable of treating 4 mgd rather than having two units capable of treating 4 mgd each. These type of grit removal facilities are extremely reliable and we do not feel the added expense of having two is worth the additional cost. Even if two units were installed, operational constraints would prevent them both from operating simultaneously anyway.

We have checked with the manufacturers and there is not a problem with operating a 4 mgd unit at 2.5 mgd. The 2.5 mgd flow rate is the approximate lift station capacity when operating with just one pump. If two units are supplied and used simultaneously, the flow rate through each unit during single pump operation will be approximately 1.25 mgd. At this low of flow rate, there could be operational problems with some equipment due to the lack of tangential force supplied by the incoming water. Consequently, if two aforementioned units were installed, we anticipate that only one would be in operation at any one time.

The moving parts associated with this style of grit removal unit are minimal, reliable, and simple. With the air lift pump style of system to provide rotational assist, there is a small single stage regenerative blower that has only two moving parts. With the paddle wheel style of rotational assist, there is a small horsepower motor and gear reducing unit. This device operates at very low RPM and has been extremely reliable. With either type of rotation assists devices, repairs can be conducted very quickly. Even without the use of these rotational assist devices, there will be some grit removal occurring. And from a practical standpoint, if the entire grit removal unit was bypassed for a few days there would be insignificant amounts of additional grit flowing to the downstream units from a long term operating standpoint.

The blow down of grit to the grit washer consists of a single automatic actuated valve controlled by a timer. These actuators are very common and easily repaired and replaced. While the actuator or valve may be out of service for replacement or repair, a manual valve in series can still be used to provide periodic blowdown of the grit.

Preliminary budget pricing for an uninstalled 4.0 mgd vortex style grit removal unit is approximately $70,000. We feel that providing two of these units makes little economic or operational sense. If a second unit is installed, there will be not only the additional equipment cost but there will be installation, additional piping and valves, and more floor space required within the building.

We feel that one grit removal unit is all that is necessary and would like your concurrence in the form of a variance. We await your timely response as we are designing the treatment plant with the intention of meeting the compliance deadlines. Thank you for your careful consideration of this issue.

Very truly yours,

FRENCH-RENEKER-ASSOC., INC

John W. Meyer

John W. Meyer, PE

JWM/tlb

kirschm