VARIANCE REQUEST
COLONY VILLAGE RESTAURANT LAGOON
1982

A variance is requested of the design standards Section 18C6 Aerated Facultative Pond Design as follows:

1. 18C6.3 Modifying the existing lagoon to air will not allow for providing flexibility of operation. Physically there is not enough room to provide earthen embankments for cell separation. The floating baffle will separate the three zones for operating in series only.

18C.6.4 The depth of the cells will all be 6.0 feet which is the maximum depth allowable using the existing lagoon. There is no way to deepen and maintain operation or bottom seal.

18C.7.5 The control structure is existing and cannot be modified. Presently there is the capability to withdraw from the 4.0 foot depth and 1.0 foot depth.

18C.7.6.3 There is no means of providing interconnecting piping. Passage of flow from Aeration Cell #1 to No. 2 will be through a 6-inch opening in the curtain wall, and flow from No. 2 to No. 3 will be through a 6-inch hole in that wall.

18.C.8.1 The existing influent manhole cannot be modified to provide for a flume due to channel configuration, manhole depth and sewer slope. See 8.2.

18.C.8.2 The final effluent will be provided with a V-notch weir attached to the overflow outlet pipe.

18.C.9. We do not plan to provide disinfection, in that the effluent passes into a field tile and has not been traced. We, therefore, don't feel there is a need to protect a Class A, B, or C stream.

As can be noted above, the variances requested all pertain to the fact that the existing lagoon cannot be modified. The topography of the adjacent land does not lend itself to the expansion of the existing lagoon. The owner does have land directly to the east which could be used, however, the cost of building a new 3 cell controlled discharge lagoon has been evaluated as follows:

iowa department of environmental quality

reply to: Akanad M. Koshy - Main Office
phone: 515/281-8971

RECORD COPY

File Name Colony Village Restaurant - Sewage

Senders Initials AMK

February 2, 1983

Colony Village Restaurant
Amana Interchange - I-80
Williamsburg, IA 52361

ATTENTION: Russ Sandensfeld

RE: Proposed Lagoon Modifications and Variance Request
Colony Village Restaurant, Amana Interchange - I-80
Iowa County, Iowa

Gentlemen:

We have completed the review of the preliminary engineering report, the variance request for the above referenced project, and your letters dated January 7th and 19th, 1983. We are in general agreement with the concept, conclusions and recommendations contained in the report and the revised schedules and sketches.

The request for variance to permit use of a curtain wall in the lagoon in lieu of earthendikes construction, will be granted, considering the private ownership, location and size of the existing retention lagoon. This variance will be granted, when a construction permit for this project is issued, with the understanding that adequate maintenance, including any repair or, if necessary, replacement of the curtain fabric, will be provided in order to maintain the intergrity of the system.

The approval of the preliminary engineering report in no way relieves the applicant from the responsibilities of ensuring that water quality limitations are met, the plant is designed and constructed in accordance with good engineering judgement and that all applicable agency approvals are obtained.

AMK:mac/WWW033K04.01

Section 455B.45, Code of Iowa, and Subrule 400--19.2 of the Iowa Administrative Code requires that plans and specifications for this facility be approved by this Department prior to commencing construction of any portion of the project. If plans and specifications have not been submitted, they must be prepared by a registered professional engineer holding a valid Iowa registration and should be received by this Department at least 120 days prior to the planned letting or initial construction date.

Contact Akanad M. Koshy at 515/281-8971 if you have any questions or comments.

Stephen W. Ballou, Executive Director

By: Lavoy Haage
WATER QUALITY DIVISION

Date: February 2, 1983

cc: Howard R. Green Company, Cedar Rapids, IA
Iowa County Board of Health
DEQ Region 6

AMK:mac/WWW033K04.02

Engineering Report Distribution

1 Engineer; 1 Region; 1 DEQ File

RECD

PRELIMINARY ENGINEERING REPORT
LAGOON MODIFICATIONS
COLONY VILLAGE RESTAURANT
AMANA INTERCHANGE I-80
NOVEMBER, 1982

History

In February, 1974, Nickerson Farms applied and received an operating permit for a retention pond for their restaurant operation. No details of the permit or lagoon are on file. In 1979, Colony Village Restaurant took over ownership and expanded the restaurant facilities. The existing single cell lagoon constructed in 1974 is shown in detail on Attachment Schedule H_1. All indications are that the single cell lagoon has operated satisfactorily since constructed.

Design Loadings

The Colony Village Restaurant now proposes to add a 60 unit motel to the present restaurant operation. This requires a review of the lagoon operation and existing loadings.

Since the restaurant operations are highly variable not only to weekly but also to seasonal fluctuations, it was determined inappropriate to try and sample the raw loading. Instead, we propose to determine existing loads from published data and estimates.

Throughout the year the restaurant serves anywhere from 100 meals per day up to maybe a 1,000 meals on a special weekend. We have tried to determine averages and the following appears realistic, not only for existing but for future operations.

Weekdays		300 meals/day
Weekends		600 meals/day
Monthly Average	=	300 x 4 + 600 x 3/7 = 430 meals/day

In reviewing the available data on waste contributions from restaurants, the estimates ranged from 3 to 20 gallons flow/meal and from 0.02 to 0.06 lbs. BOD/meal.

From this range the following was selected:

Flow	15 gallons/meal
BOD	.05 lbs./meal

APPROVED
FEB [illegible] 1983
STATE OF IOWA
DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER QUALITY DIVISION

Howard R. Green Company
CONSULTING ENGINEERS

Existing and design loads from the restaurant operation would then be:

Flow	430 x 15 gallons/meal = 6,450 gallons/day
BOD	430 x .05 lbs./meal = 21.5 lbs./day

For the proposed initial operation of 60 units, the literature data ranges from 25 to 100 gallons/day/unit and BOD from 0.075 to .15 lbs./unit/day.

From this range the following was selected:

Flow	75 gallons/unit/day
BOD	0.10 lbs./unit/day

Assuming up to 75% occupancy on a monthly basis, the following design loads are projected:

Flow	60 x .75 x 75 = 3,375 gallons/day
BOD	60 x .75 x .10 = 4.5 lbs./day

Total design loading for the single cell system would then be:

Flow	9,875 gpd or 10,000 gpd
BOD	26.0 lbs./day

Lagoon Design

The existing single cell lagoon has the following physical characteristics:

Water Surface Dimensions	155' x 150'
Depth	5.2 feet
Bottom Dimensions	120' x 115'
Volume	712,000 gallons
Detention Currently	110 days
Surface Area	.53 acres
BOD Loading	40 lbs./acre

It would appear that the existing lagoon is operating near the limits of design, however from all indications there appears to be no problems. To handle the additional loadings for the proposed motel, we would propose modifying the system by adding air and then operating a modified aeration basin.

An aerated lagoon design is based upon detention, temperature, removal efficiencies and oxygen additions.

Removal Efficiency required would be:

$$E = \frac{\frac{26.0}{.01 \times 8.34} - \text{25.0 mg/l effluent}}{\frac{26.0}{.01 \times 8.34}} = \frac{311-25}{311} = 92\%$$

Aeration Time:

$$\frac{.92}{2.3(.06)(100-92)} = 83 \text{ days}$$

Volume:

83 x 10,000 gpd = 830,000 gallons

Increase depth of lagoon to 6.0 feet from 5.2 feet.

Volume now:

860,700 gallons

Oxygen Requirements

To provide 26.0 lbs. of oxygen per day, it is proposed to use "Edi-Reef" submerged diffusers. Sizing of the units is as follows:

BOD/day	=	26.0 lbs.		
Ultimate	=	26.0 x 1.5	=	39.0 lbs./day
Converstion to STP	=	39.0 x 1.6	=	62.4 lbs./day
lbs./hour	=	62.4/24	=	2.6 lbs. oxygen/hour

Checking Edi-Reef Graph:

Depth	6'
Air	15 cfm/unit
Transfer	0.88 lbs. oxygen/hour

2.60/.88 = 2.93 = 3 units

Air

3.0 x 15 cfm	= 45 cfm	
Depth	= 6.0' =	2.6 psi
H_L - Fittings, Valves, Header		1.0 psi
Initial Water Clear		1.0 psi
		4.60 psi

Blower 45 cfm @ 5.0 psi
2 - Sutorbilt 2 MB - 1.6 Bhp @ 3,800 rpm

The aerators will be aligned on the centerline of the lagoon spaced on 30' centers.

A quiescent cell will be provided at the outlet using a floating baffle curtain. The curtain will be 6.0 feet deep and made of PVC lined polyester with a weight of 22 oz./ft.^{2}. A bottom embedded chain along with concrete anchors will maintain the position. The embankment ends will be tapered.

The quiescent basin will be as shown on H_1 and the volume within the area will be:

33 x 12 x 6 + 33 x 21 x 6/2 =
2376 + 2079 = 4455 ft.^{3} = 33,323 gallons
Retention time = 33,000/10,000 gpd = 3 days

PROCESS – The EDI "REEF"* aeration system offers many process advantages:

High Oxygen transfer rates (rate increases with liquid depth)
High pumpage & liquid circulation rates
Effective in any liquid depth
Offers adjustable air flow rates for:
  a. Variable loadings
  b. Tapered aeration
  c. Seasonal variations
Suitable for new installations or for upgrading existing installations
Aerated lagoons or activated sludge applications
Energy distributed throughout basin for mixing and/or aeration
System can accommodate large variations in lagoon floor elevation
Adaptable to any shape basin

ECONOMY – The economic advantages of the EDI "REEF" aeration system include:

Economical system first cost
Low installation cost for both new installations and upgrade applications
Low operation cost because of
  a. Low O & M requirements
  b. Low energy consumption
Improves land utilization by allowing higher loadings per unit area

MECHANICAL – The mechanical simplicity of the EDI "REEF" aeration system allows reliability and flexibility of application and operation:

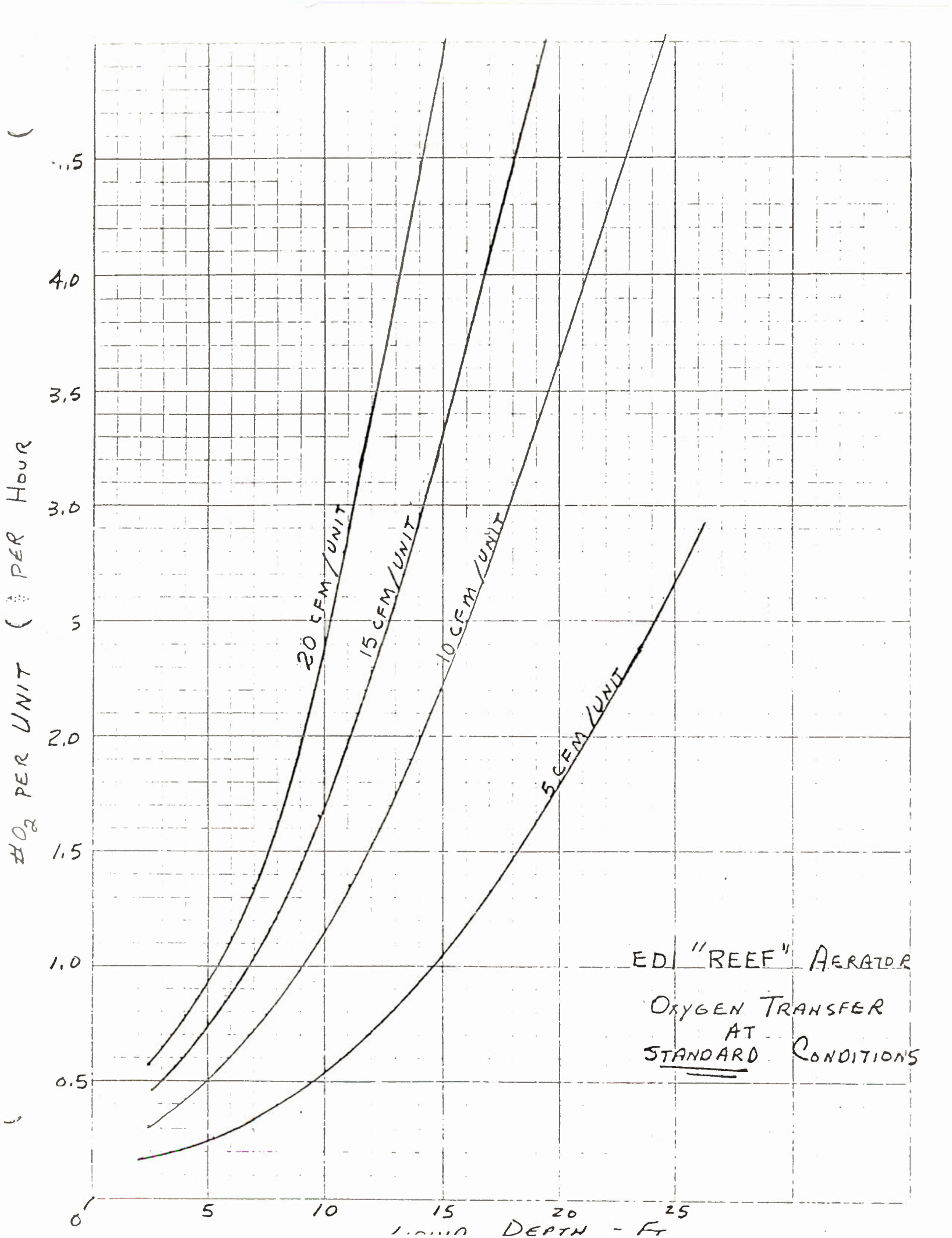
No freezing problems in cold climates
No moving parts in the aeration basin
Heat added to the liquid during operation
Corrosion resistant materials used, i.e. concrete, PVC, stainless, etc.
No scour of lagoon bottom in earthen basins
Can be applied on lined lagoons without special precautions
Aerator can be removed from basin for inspection or maintenance without dewatering basin
Reliable compressors located on the lagoon or aeration basin berm for ease of maintenance
No power lines into basin

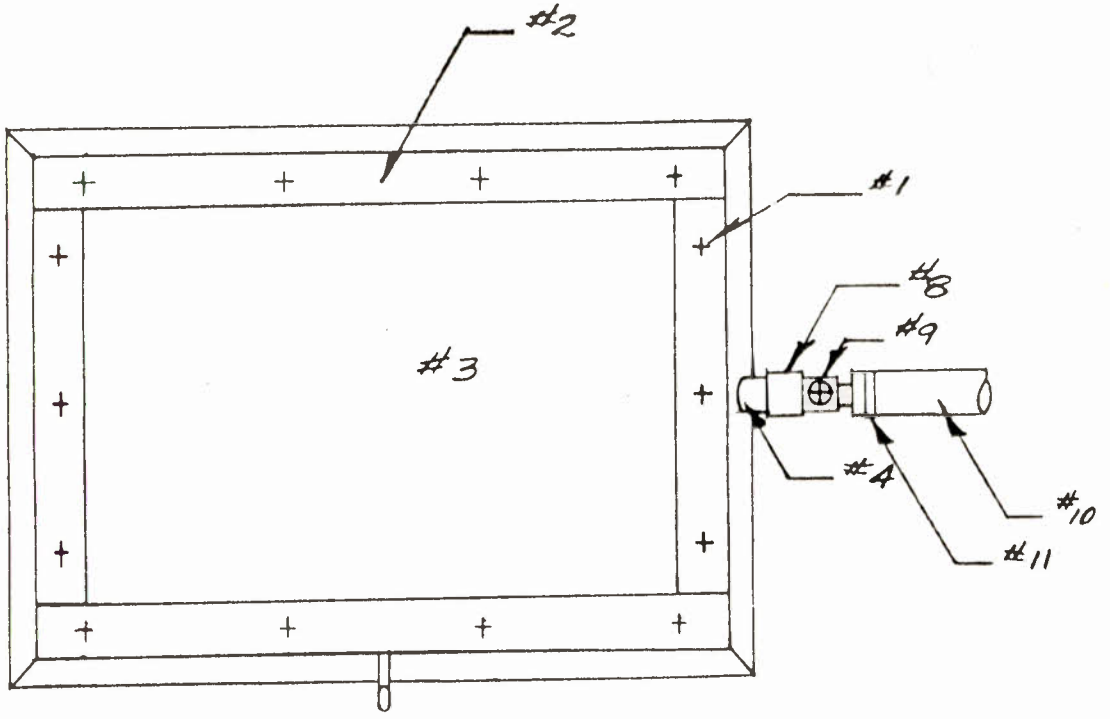
FUNCTION – High oxygen transfer and large pumpage rates are assured by exposing large aeration surfaces to the liquid. Ultra fine bubble formation and release creates maximum bubble contact area with optimum oxygen transfer efficiency and optimum liquid pumpage. The large column of air-water mixture creates a major airlift pumping action at each aeration unit. Turbulance from this pumpage results in additional shear and mixing of the small bubbles. A significant air-liquid boil develops above the nominal liquid surface which provides sufficient hydraulic head to create large pumpage currents across the basin surface. The airlift movement of liquid from the basin floor and resultant surface pumpage creates maximum circulation. This circulation is effective over a wide area as direct pumpage plus induced eddy currents distribute oxygen-rich liquid to all areas of the basin.

RELIABLE – EFFICIENT – ECONOMICAL – FLEXIBLE
"REEF"* Aeration and Mixing Systems by E.D.I. (*Patents applied for)

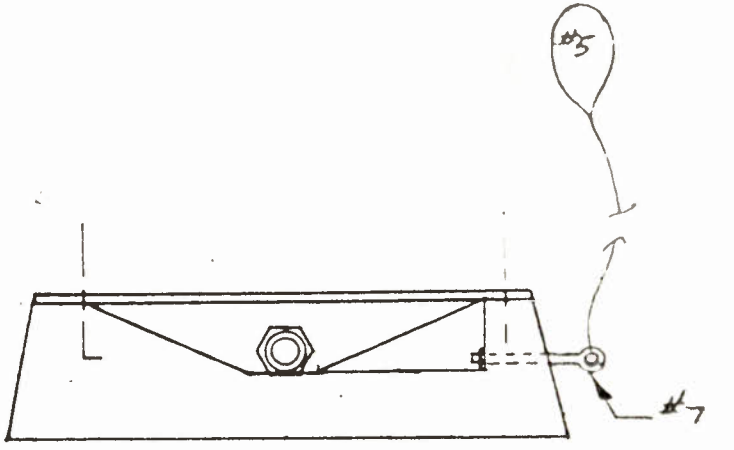
Environmental Dynamics Inc. *Environmental Systems Since 1975*
Corporate Office – Columbia, Missouri 65201

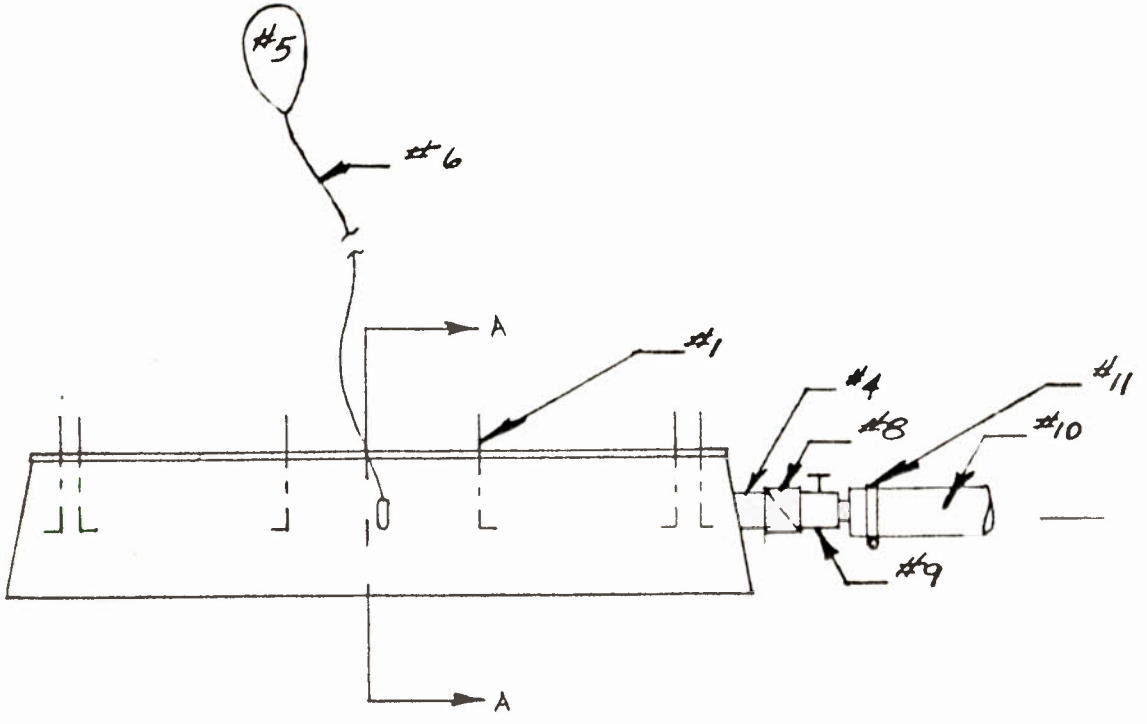
March 1, 1982


#O2 PER UNIT (#) PER HOUR
4.5
4.0
3.5
3.0
5
2.0
1.5
1.0
0.5
0
5
10
15
20
25
LIQUID DEPTH - FT
20 CFM/UNIT
15 CFM/UNIT
10 CFM/UNIT
5 CFM/UNIT
ED "REEF" AERATOR
OXYGEN TRANSFER
AT
STANDARD CONDITIONS



ITEM No.	ITEM
1.	STAINLESS ANCH BOLTS ½" ø
2.	STAINLESS STRAP
3.	FINE BUBBLE DIFFUSER PLATE SIZE 12" x 18" EFFECTIVE AREA
4.	SCH. 80 PVC NIPPLE
5.	FLOAT TO LOCATE & REMOVE AERATOR
6.	NON-DEGRADABLE CORD
7.	EYE BOLT
8.	OPTIONAL CHECK VALVE
9.	OPTIONAL THROTTLING VALVE
10.	FLEXIBLE RUBBER HOSE TO AIR LATERAL
11.	STAINLESS HOSE CLAMP





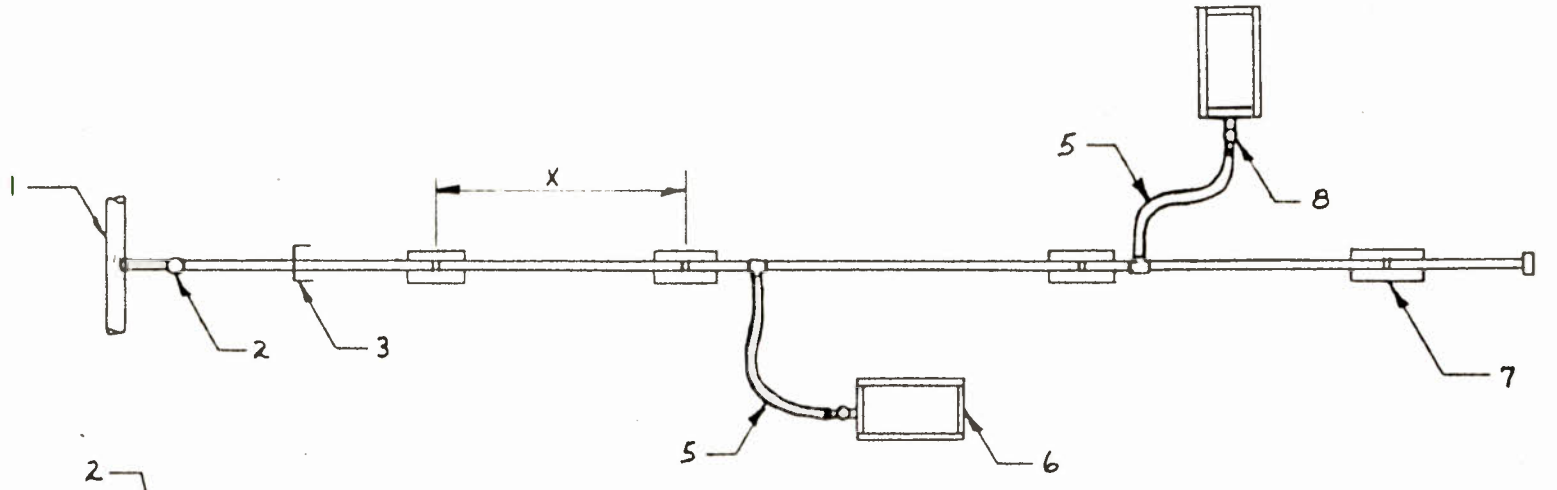
EDI - "REEF"

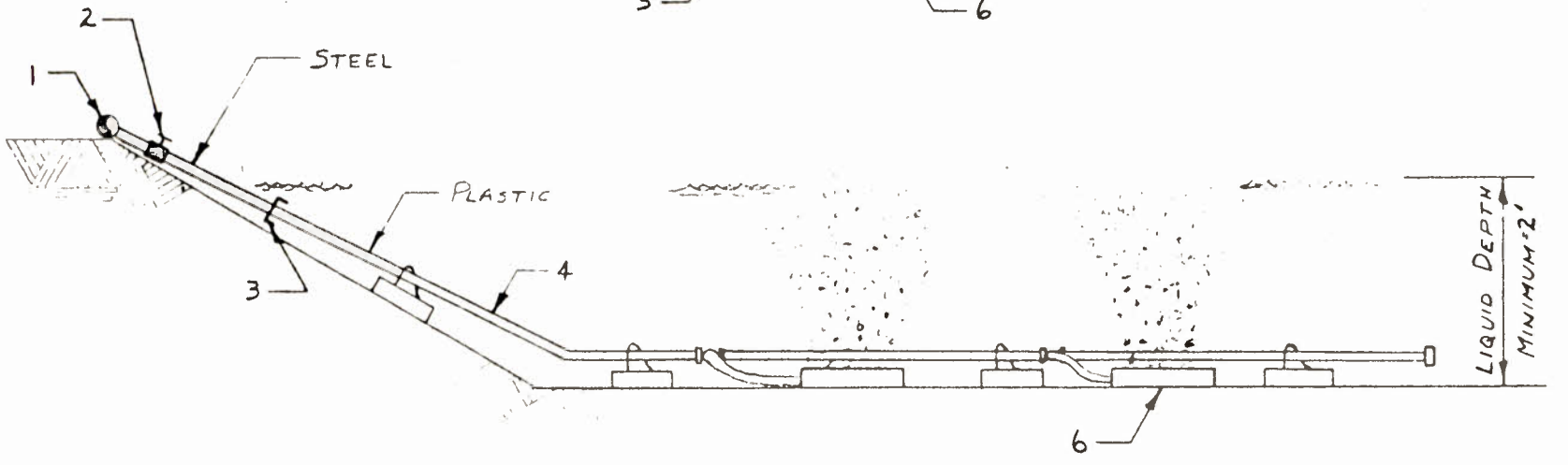
AERATION SYSTEM

AERATOR UNIT STD. DWG.

DATE 1-19-82

ENVIRONMENTAL DYNAMICS INC.
COLUMBIA MO 65201





ITEM NO.	ITEM
1	AIR HEADER
2	LATERAL THROTTLING VALVE
3	STEEL TO PLASTIC ADAPTER
4	PVC AIR LATERAL
5	FLEXIBLE AIR SUPPLY LINES
6	EDI AERATOR UNIT (SEE DETAIL)
7	EDI ANCHOR BALLAST BLOCK (SEE DETAIL)
8	OPTIONAL CHECK VALVE & AIR BALANCING VALVE

NOTE: X = 12 Ft for 1½" Ø PVC
= 10 Ft for 2" Ø PVC
= 8 Ft for 3" Ø PVC

EDI LAGOON AERATION SYSTEM TYPICAL INSTALLATION LAYOUT	SCALE NONE
	DATE 1-25-82
ENVIRONMENTAL DYNAMICS, INC. COLUMBIA, MO 65201	SHEET NO 8-SD-31

IOWA DEPARTMENT OF ENVIRONMENTAL QUALITY

MEMORANDUM

To ~~Jim Barron~~ Larry

Date 1/27/83

☐ Action	☐ Correction	☐ Reply Direct.
☑ Approval.	☐ Information	☐ Do Not Return
☑ As Requested	☐ Note & Return	☐ See Me
☐ Review/Comme	☐ Per Conversation	☐ Sign
☐ File	☐ Reply For Signature	☐ _____

Colony Village Restaurant

Request for variance

Additional information you requested.

As I understand it then, the sole reason for the variance is the need for curtain walls rather than building earthen berms. I dont have any problem with this based on our limited experience. The permit should contain spcial language (over)

From	Division/Section	Phone
Larry		

OA38 (May 79)

requiring maintenance & replacement of the curtain walls as needed.

The monitoring program should also be carefully watched some newly operation is expected. This facility will also serve to increase our knowledge on these systems.

after it's issued prepare an agenda item brief for the EQC.

Date: 1/24/83
To: Jim Brown
From: Larry Hoage
Re: Request for a variance
Colony Village Restaurant Lagoon modification

The applicant has requested a variance to install curtain walls in a .5 acre existing lagoon. Aeration will also be added. Construction of earthen dikes would reduce the capacity to the point where it would not meet our design standards. The topography is such that a second cell can not be constructed following the existing cell.

It would be possible to construct a controlled discharge lagoon at another site however, the owner does not feel the additional cost can be justified. The cost of a new 3-cell lagoon is estimated to be $63,000 compared to $17,500 to modify the existing lagoon with curtain walls and aeration equipment.

The existing lagoon now serves a restaurant and and they are preparing to add a 60 unit motel. According to the engineer the existing lagoon is operating satisfactorily and is in good shape physically

In the past we granted a variance to the city of Ely to install curtain walls. They also added aeration. The monitoring report data for 1982 shows the is doing a good job. The average monthly BOD's for the first 10 months of 1982 were less than 24 mg/l.

I talked with Steve Baumgarn of Region #1 and he stated the curtain wall appeared to be in good shape. It had been installed for about 1½ years, 1 winter.

Because of the satisfactory experience we have seen with curtain walls and the reduced cost, I recommend the variance be granted.

January 24, 1983 Project No. 583-21

Lavoy Haage:

Re: Colony Village Restaurant Lagoon Modification.

A preliminary engineering letter report was received for the subject project on November 19, 1982. The engineers for the project is Howard R. Green Company. The engineers, on behalf of the owners, are requesting a Varience to use Curtain walls to divide the existing one cell lagoon into 3 cell aerated facultative lagoon system.

History The existing single cell Lagoon constructed in 1974 and owned by Nickerson Farms was operating satisfactorily according to the engineers. DEQ has no record of a Construction permit or an operation permit for the said facility.

Colony Village Restaurant bought out the Nickerson Farms operation at the Amana Interchange I-80. They are proposing to add a 60 unit Motel to the present restaurant operation.

Using the available user data of the restaurant operation and projected motel occupancie the area contained by the existing single cell lagoon system will be quite satisfactory for convertion to a 3 cell aerated facultative lagoon system. ~~But it provides intermediate dike space for dike construction~~ But it will not provide space for the construction of intermediate dikes. Therefore the engineer is porposing to use Curtain walls.

The construction cost for the intermediate dike compared to the curtain walls will be ~~was~~ prohibitive. ~~and~~ The engineer in his letter dated November 30, 1982 states that "We would request the varience because it is nearly impossible to construct a second aeration cell in the existing lagoon to meet the present design standards".

Engineer, during our project discussions informed me that plenty of land is available for expansion of the lagoon system but the topography of the available land is not ~~favorable for any such facility construction~~ favorable for the construction of any such facilities. Rough ~~estimate~~ cost estimate is attached for your information.

Thus based on: a) unfavorable topography of the available land for expansion of the existing lagoon system

b) prohibitive cost of construction of intermediate dike and the effect of such dikes on the ~~Volume~~ Capacity of the so created cells

and c) low cost and effective operation of the lagoons, ~~modified with~~ with the use of curtain walls the request for ~~app~~ a varience to use curtain walls for the

modification of the existing single cell lagoon, may please be favorably Considered.

Sincerly
Water Quality Division

Edward Hickey
Environmental Engineer
Construction Permits Section

Howard R. Green Company
CONSULTING ENGINEERS

January 19, 1983

Akanad Koshy
Construction Permit Section
Iowa Department of Environmental Quality
Henry A. Wallace Building
900 East Grand
Des Moines, IA 50319

Re: Proposed Lagoon Modification
Colony Village Restaurant
Interchange I-80 Iowa County

Dear Mr. Koshy:

With regard to your letter of January 18, 1983 we can answer as follows:

1. We would propose to add water meters to the well supply to obtain influent flow.

2. We would withdraw our variance request to delete influent flow measurement.

3. We have modified Schedule K2 to reflect the above.

We trust this satisfies all DEQ's requirements and we will receive approval of the engineering report.

Very truly yours,

Robert A. Frederick, P.E.

mp

cc: Colony Village Restaurant

4250 Glass Rd., N.E. • P.O. Box 9009 • Cedar Rapids, Iowa 52409 • Phone 319/395-7805

R. 6.1.

iowa department of environmental quality

reply to: Akanad M. Koshy - Main Office
phone: 515/281-8971

January 18, 1983

Colony Village Restaurant
Amana Interchange - I-80
Williamsburg, IA 52361

ATTENTION: Russ Sandenfeld

RE: Proposed Lagoon Modification and Variance Request,
Colony Village Restaurant, Amana Interchange I-80, Iowa City, Iowa

Gentelmen:

We are in receipt of your second variance request, dated January 7, 1983, from your engineers Howard R. Green Company of Cedar Rapids, Iowa. We have noted that you are requesting a variance to permit you to delete the influent flow measurement for the lagoon system.

It is very important to determine influent flow to the treatment facility as accurately as possible. The plant operation and the effluent from the plant should meet the conditions stipulated in the NPDES (Operation) permit. Influent flow measurement is one of the requirements in the NPDES permit.

The projected flow being around 10,000 gallons per day and cannot be accurately measured by using any of the availabe sewage flow measuring equipments, we may not have any objections to your using water meters to measure the water usage for the restaurant and motel facilities. We, therefore, encourage you to reconsider your variance request in this regard.

An assurance that existing lagoon can be used as proposed, will not be given, except that the preliminary engineering report approval will be given as and when the said reports fully complies with the Iowa Wastewater Facilities Design Standards, Chapter 18c, Wastewater Treatment Ponds (Lagoons) and the reliability and safety requirements.

Issuance of construction permit is dependant on the priority of the receipt of the plans, specifications, and all applicable schedules by this Department and their completeness.

AMK:bkp/WWW018P01.01

If you have any further questions regarding the subject project, please contact Akanad M. Koshy at 515/281-8971.

Sincerely,

WATER QUALITY DIVISION

Akanad M. Koshy
Environmental Engineer
Construction Permit Section

AMK:bkp/WWW018P01.02

cc: Howard R. Green Company, Cedar Rapids, IA
DEQ Region 6

Howard R. Green Company
CONSULTING ENGINEERS

January 7, 1983

Akaned Koshy
Construction Permit Section
Iowa Department of Environmental Quality
Henry A. Wallace Building
900 East Grand
Des Moines, IA 50319

Re: Proposed Lagoon Modification
Colony Village Restaurant
Interchange I-80 Iowa County

Dear Mr. Koshy:

With regard to your letter of December 21, 1982, we have the following comments:

1. The outlet end of the 4.0' level drawoff pipe will be raised to maintain the depth at 6.0'.

2. For flow measurement, we understand that 18C.8.1 requires influent flow monitoring, however, as you know, the daily flow will only be 10,000 gpd or 7 gpm. A 2" Parshall flume will handle 200 gpm, therefore, we would be in the less than 5% reading area and accuracy would be lost. We can't see spending $2,500.00 and continual maintenance to provide inaccurate readings. In addition, for this type of motel, restaurant operation, there won't be any growth, therefore, flows and loadings will be relatively constant, and the need for monitoring is lessened. We would like to request variance under 18C.8.3 Small Facilities.

3. We understand that 18C.7.2.7 requires protection, however, this lagoon has been in operation for seven years and no signs of erosion are evident. The type of aeration proposed will not cause wave action or embankment scour. We would like to again save the estimated $2,500.00 cost. We would request a variance to not provide the erosion protection now, but if erosion does start, we would then add protection. Since the lagoon is already in operation, there would be no difference in cost or method, adding it later or now. When DEQ inspects the lagoon periodically, they can check for erosion and notify that owner to provide it at that time.

4250 Glass Rd., N.E. • P.O. Box 9009 • Cedar Rapids, Iowa 52409 • Phone 319/395-7805

iowa department of environmental quality

reply to
phone

RECORD COPY

File Name *Colony Village Restaurant - Sewage*

Senders Initials *[illegible]*

December 21, 1982

Colony Village Restaurant
Amana Interchange - I-80
Williamsburg, IA 52361

ATTENTION: Mr. Russ Sandenfeld

RE: Proposed Lagoon Modification and Variance Request Colony Village Restaurant, Amana Interchange - I-80, Iowa County, Iowa

Gentlemen:

We have completed the review of the referenced project and the variance request. We have the following comments.

1. Adjustment should be made in the control structure or at the withdrawal pipe end to permit operation at six (6) feet depth.

2. Effluent flow measurement and continuous recording facilities should be incorporated with the rehabilitation/expansion of the lagoon system.

3. Erosion protection shall be provided for the inner embankments of all aerated cells, regardless of size. The erosion protection shall be provided completely around the inner embankments and shall be placed from two (2) feet below the minimum operating depth to one (1) foot above the maximum operating depth (measured on the vertical).

Upon receipt of a satisfactory response for the above comments, we will proceed further into the finalization of this project. Variance will be granted for the use of Curtain Walls together with the issuance of the construction permit for the project.

[illegible] (515) [illegible]-8973.

Sincerely,

WATER QUALITY DIVISION

[signature]

Ahmad [illegible] Fathy
Environmental Engineer
Construction Permits Section

[illegible]

cc: Howard R. Green Co., Cedar Rapids, IA
[illegible]

Main Office: Henry A. Wallace Building, Des Moines, Iowa 50319

Regional Office #1	Regional Office #2	Regional Office #3	Regional Office #4	Regional Office #5	Regional Office #6
209 N. Franklin St.	509 S. President	401 Grand Ave.	316 Walnut	Henry A. Wallace Building	117 N. 2nd Ave.
Manchester 52057	P.O. Box 1443	P.O. Box 270	Atlantic 50022	Des Moines 50319	P.O. Box 27
	Mason City 50401	Spencer 51301			Washington 53253

Akaned Koshy
Construction Permit Section
Iowa Department of Environmental Quality
Des Moines, IA 50319

Re: Proposed Lagoon Modification
Colony Villlage Restaurant
Interchange I-80 Iowa County

We trust that you will also agree that spending the $5,000.00 as requested in 2 and 3 is hard to justify and will allow our request for a variance.

As we indicated, the onwer is anxious to proceed with design and layout of the motel, but will not unless we have DEQ's assurance that the existing lagoon can be used as we have proposed. In your reply to this letter, would you indicate the following:

1. Assurance that the existing lagoon can be used as proposed.
2. Indication that the owner may proceed with the design and construction of the motel.
3. Position on Items 2 and 3 presented above.
4. Timetable for construction permit.
5. Indication of what additional is needed for construction permit.

If there are any questions, please give me a call.

Very truly yours,

Robert A. Frederick, P.E.

/kd

cc: Colony Village Restaurant

Howard R. Green Company
CONSULTING ENGINEERS

Dec. 1 ✓

November 30, 1982

Mr. Fred Evans
Iowa Department of Environmental Quality
Henry A. Wallace Building
900 East Grand
Des Moines, IA 50319

Re: Permit Application
Lagoon Modifications
Colony Village Restaurant
Amana Interchange I-80

Dear Fred:

As per our conversation we have enclosed four copies each of Schedules A, G, H, K_2 and page four of the Report which have been revised to show:

1. The aeration cell will be divided into 2 cells with a floating baffle.

2. We will put a 60° V-notch on the overflow pipe.

We would like to request a variance of the requirement of 2 separate aeration cells, and instead provide the floating baffle wall. This wall will provide flow from one cell to the next through a 6-inch opening. We would request the variance because it is nearly impossible to construct a second aeration cell in the existing lagoon to meet the present design standards.

If there are any questions please feel free to give me a call.

Very truly yours,

Robert A. Frederick, P.E.

mh
Enclosures
cc: Russ Sandersfeld, Colony Village Restaurant

4250 Glass Rd., N.E. • P.O. Box 9009 • Cedar Rapids, Iowa 52409 • Phone 319/395-7805

VARIANCE REQUEST
COLONY VILLAGE RESTAURANT LAGOON
1982

Land		$ 0
Excavation		$30,000
Structures		$10,000
Sewer Extension 500' @ $10.00/ft.		$ 5,000
Fence		$ 7,000
		$52,000
Miscellaneous		$11,000
	Total	$63,000

The cost versus the following estimate for modifying the existing:

Floating Curtain		$ 4,000
2 Blowers		$ 4,000
Building & Wiring		$ 2,000
Aerators & Piping		$ 2,000
Installation		$ 3,000
		$15,000
Miscellaneous		$ 2,500
	Total	$17,500

Since the Owner is only installing a 60 unit motel, there can't be any cost justification for a $63,000 expenditure.

With the modifications as proposed, it is felt that the level of treatment will be greater than that existing which is currently providing no problems. With the small amount of additional wastes proposed, the modifications will benefit the overall lagoon effluent far more than any variances granted will possibly reduce effluent reliability.

Howard R. Green Company
CONSULTING ENGINEERS

June 11, 1985

Mr. Akanad Koshy
Construction Permit Section
Iowa Dept. of Water, Air & Waste Management
Henry A. Wallace Building
900 East Grand
Des Moines, IA 50319

Re: Proposed Lagoon Modifications
Plans and Specifications
Colony Village Restaurant
Interchange I-8, Iowa County
Project No. F-83-21

Dear Mr. Koshy:

As per our conversation, we have added a Section 12.10 on Page 1-5. The guarantee will be provided by the aerator manufacturer to provide the necessary aeration capability at no cost to the owner.

As noted, the quarantee will be in writing, which the Owner may use, which we feel is satisfactory. In talking with Aeration Industries, they will furnish a 2.0 Hp for the same cost as a 1.0 Hp and hence we'll go with the larger unit as a greater safety factor.

We trust this satisfies your requirements.

Very truly yours,

Robert A. Frederick, P.E.

pam

4250 Glass Rd., N.E. • P.O. Box 9009 • Cedar Rapids, Iowa 52409 • Phone 319/395-7805

Howard R. Green Company
CONSULTING ENGINEERS

June 5, 1985

Mr. Akanad Koshy
Construction Permit Section
Iowa Dept. of Water, Air & Waste Management
Henry A. Wallace Building
900 East Grand
Des Moines, IA 50319

Re: Proposed Lagoon Modifications
Plans and Specifications
Colony Village Restaurant
Interchange I-80, Iowa County
Project No. F-83-21

Dear Mr. Koshy:

We are enclosing four (4) sets of revised plans and specifications for this project.

The plans and specifications have been changed to provide two (2) aerators in the lagoon with no standby, as per our conversation.

We are in touch with three (3) aerator manufacturers and the units could be 1.0, 1.5 or 2.0 HP depending upon the supplier. Two (2) 1.0 HP units will supply 6.0 lbs. O_2/HP/hr. or 144 lbs. O_2/day at STP versus our calculated 39.0 lbs./day. We have included a revised Schedule H and K_2 noting this change.

Very truly yours,

Robert A. Frederick, P.E.

tc
Enclosures

4250 Glass Rd., N.E. • P.O. Box 9009 • Cedar Rapids, Iowa 52409 • Phone 319/395-7805

Cw

RECORD COPY

File Name Colony Village Restaurant - Sewage
Iowa County

Senders Initials LH

Iowa
department of water, air and waste management

June 4, 1985

Howard R. Green Company
4250 Glass Road, N.E.
P. O. Box 9009
Cedar Rapids, IA 52409

ATTENTION: Mr. Robert A. Frederick, P.E.

RE: Proposed Lagoon Modification
Colony Village Restaurant
Interchange I-80, Iowa County
Project No. F-83-21

Gentlemen:

We have reviewed your request for variance to change the configuration of the proposed modification to the existing single cell controlled Discharge Lagoon for Colony Village Restaurant. After due consideration of the facts presented by you in your letter of May, 1, 1985, we are hereby granting you variance to allow one aerated cell, under the following conditions.

1. Two floating aerators shall be installed with capacity to maintain 2 mg/l of oxygen in all cells at all times.

2. One aerator shall be located close to the discharge of the influent pipe in the lagoon.

3. Submit revised plans, specifications and schedules A and K_2 incorporating the above conditions and requirements for our review.

If you have any comments or questions, please contact this Department at 515/281-8960.

Sincerely,

PROGRAM OPERATIONS DIVISION

Lavoy Haage

Lavoy Haage, Chief
Wastewater Permits Branch

LH:AMK:rlz/WWPW151K05.01

cc: Region 6

RECORD COPY

File Name Colony Village Restaurant - Sewage
Amana Interchange I-80
Senders Initials

STATE OF IOWA
DEPARTMENT OF WATER, AIR, AND WASTE MANAGEMENT
HENRY A. WALLACE BUILDING
DES MOINES, IOWA 50319

CONSTRUCTION PERMIT

Colony Village Restaurant
Amana Interchange at I-80
Williamsburg, Iowa 52361

Permit No.: 85-143-S

File: Colony Village Resturant - Sewage
Amana Interchange at I-80 Iowa County

Re: Modification of the Lagoon System

WAWM Project No.: S83-21

In accordance with the provisions of Sections 455B.173.9 and 455B.174.4, Code of Iowa, and Rule 900--64.2(455B) or Rule 900--65.5(455B), or Rule 900--41.12(455B) of the Iowa Administrative Code, the Executive Director of the Department of Water, Air and Waste Management does hereby issue a permit for the construction of:

The modification of the existing single lagoon controlled discharge lagoon system to a two cell aerated lagoon continuous discharge system.

By the issuance of this permit, the permittee is granted variance to use curtain walls to seperate the aerated pond and quiescent cell and to construct a single aerated pond and a quiescent cell instead of two aerated ponds and quiescent cell as approved after review of the preliminary engineering report.

The wastewater treatment facility approved under this construction permit is designed to treat an organic loading of 26 pounds of BOD_5 per day while handling an average daily hydraulic loading of 10,000 GPD. The facility has been designed to meet the effluent limitations of:

Parameter	Daily Ave.	Maximum
Biochemical Oxygen Demand (5-day)	30 mg/l	45 mg/l
Suspended Solids	80 mg/l	120 mg/l
pH	Minimum 6.0	Maximum 9.0

A monthly average removal of 85% is also required.

The construction of the project shall be initiated within one year of issuance of this permit or this permit is no longer valid. Within thirty days after completion of construction, the permit holder shall submit a certification by a registered professional engineer that the project was completed in accordance with the approved project documents.

Pursuant to Section 455B.174.4, Code of Iowa, you have the right to appeal any condition of this permit by filing with the Executive Director of the Department of Water, Air and Waste Management a notice of appeal and request for administrative hearing within thirty days of receipt of this permit.

Contact Akanad M. Koshy at 515/281-8960 with any questions or comments.

For the Department of Water, Air and Waste Management:

Stephen W. Ballou, Executive Director

By: Larry Haage
PROGRAM OPERATIONS DIVISION

Date: June 25, 1985

cc: Howard R. Green Company, Cedar Rapids, IA
County Board of Supervisors, Iowa County, IA
County Board of Health, Iowa County, IA
Iowa Department of Health, LOCAL
WAWM Region 6

AMK:pla/WWPW198M01.01

Plan Distribution

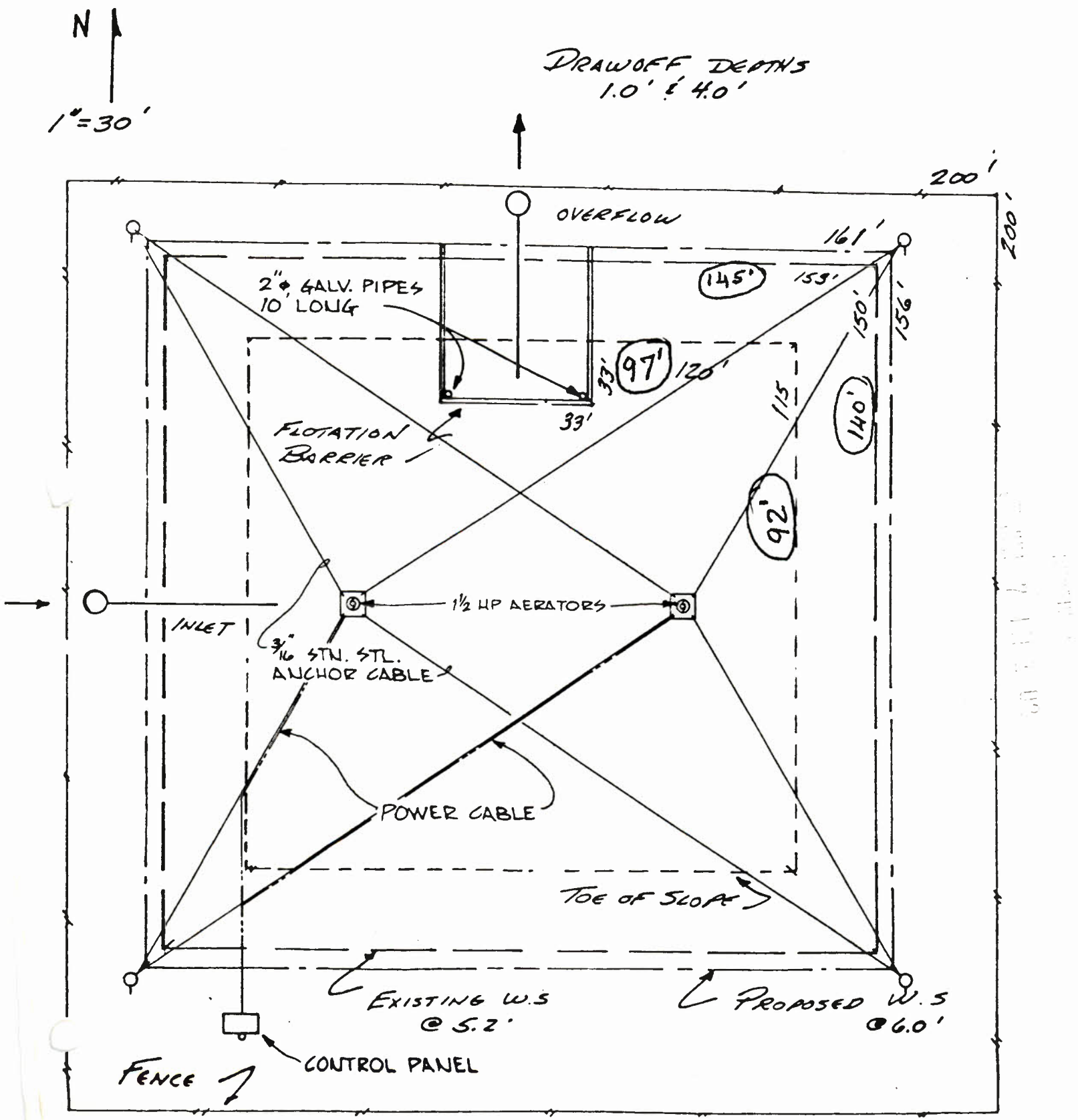
1 Engineer; 1 Region; 1 WAWM File

Date Prepared
Date Revised 4-29-85

IDEQ-C&WQ
Project No. F-83-21

Schedule H1 - Schematic Flow Diagram

Project Identity Colony Village Restaurant - Amana Interchange I-80

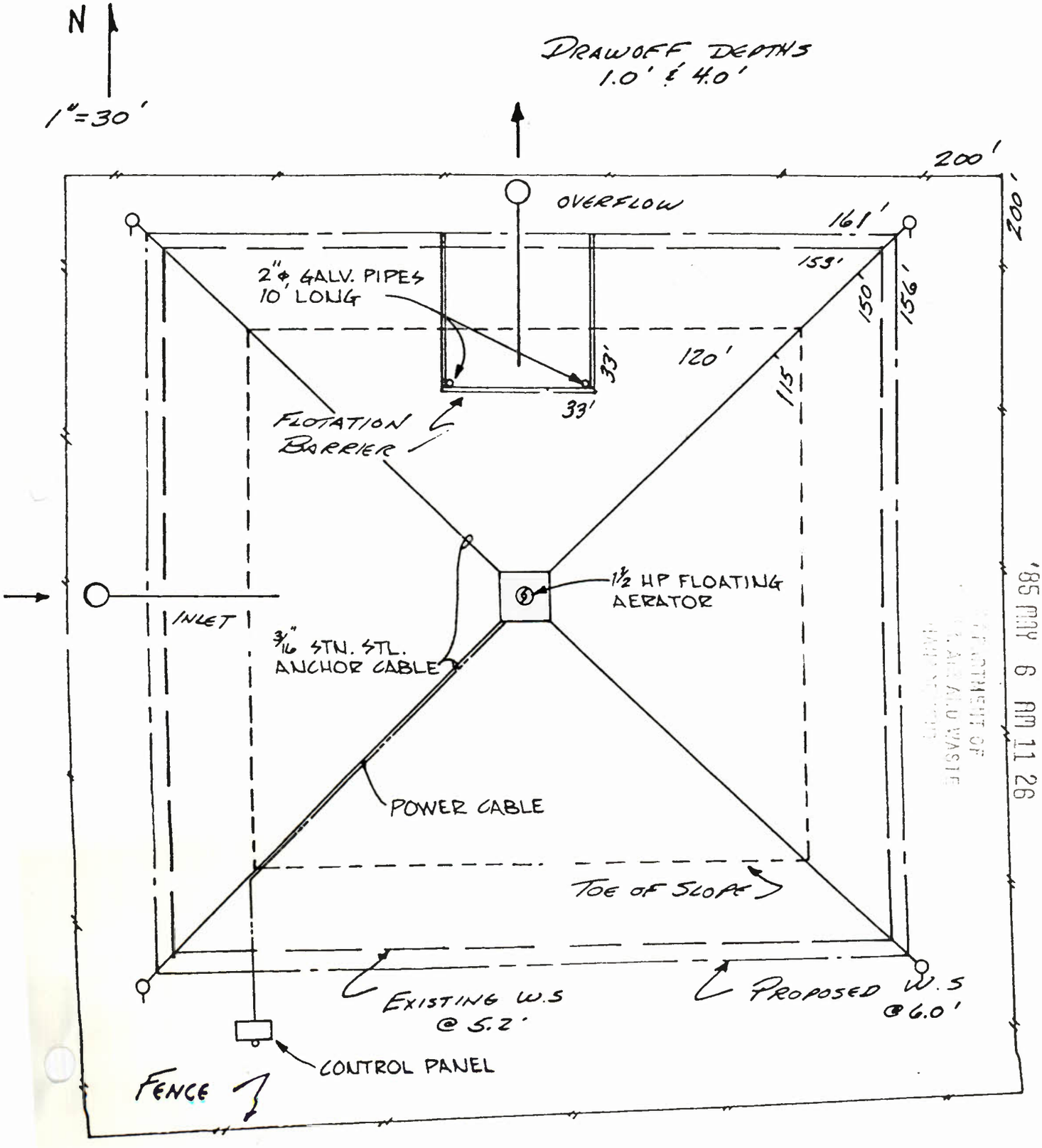


Date Prepared
Date Revised 4-29-85

IDEQ-C&WQ
Project No. F-83-21

Schedule H1 - Schematic Flow Diagram

Project Identity Colony Village Restaurant - Amana Interchange I-80



Date Revised 4-29-85

IDEQ-C&WQ
Project No. F-83-21

Schedule K2 - Aerated Pond

1. Project Identity Colony Village Restaurant - Amana Interchange I-80

Design Basis:	AWW	MWW	PHWW
Flow, MGD	.01	.015	
BOD_5, #/Day	26.0	26.0	

2. No. of soil borings taken NA. Data included in the existing lagoon.
High groundwater elevation (MSL) 10 feet below bottom.

3. Top of dike elevation (MSL) NA ft. 100 year flood elevation (MSL) NA ft.

4.

Pond Data	Cell 1	Cell 2	Cell 3	Cell 4	Total
Surface area @ maximum depth (A)	.54	.02			.56
Maximum operation depth (ft)	6.0	6.0			
Minimum operation depth (ft)	5.2	5.2			
Effective storage volume (MG)	.84	.02			.86
Effective detention time (days)	86	2			88
Air Requirements:					
Provided (ft^3/#BOD)					
Provided (#O_2/#BOD)	1.5				
Required (#O_2/#BOD)	1.1				
Minimum D.O. level (mg/l)	1.0				
Freeboard @ maximum depth (ft)	2.0'	2.0'			
Top width of dike (ft)	5.0	5.0			
Inner embankment slope H/V	4:1	4:1			
Outer embankment slope H/V	4:1	4:1			
Type of inlet	6" CIP	CURTAIN			
Top drawoff level (ft)	4.0'	4.0'			
Middle drawoff level (ft)					
Bottom drawoff level (ft)	1.0	1.0			

5. Aeration Equipment: Design Air Temperature 100 °F to ____ °F.
Type surface aerator. Manufacturer & Model Airolator-SA-15-1
No. of Units 2. HP or CFM/unit 1.5 HP Total HP or CFM 3.0 HP.
K value .06 /day at design temperature 1 °C
Is a layout of the aeration system given on Schedule H1? Yes X No ____.

6. Is cold weather protection provided? Yes How? Submerged motor.

7. Method of raw flow diversion to cells None.

8. Method of interconnection of cells Flotation curtain opening to final cell.

9. Provision to prevent drawoff of floating solids Submerged outlet.

10. Method of sampling None - grab.

11. Type of flow measurement Water meters Location Well supply.

12. Fence Height 42" No. strands of barbed wire: Top 1 Bottom ____.

13. Number of warning signs 4. Location all four sides.

14. Will pond be pre-filled to 2 ft. level? Yes ____ No ____ Already Filled

15. Maximum allowable leakage rate NA in/day.
Method of testing leakage rate ____.

16. Are specifications included for:

a. Seeding	Yes ____	No ____	
b. Soil sterilization	Yes ____	No ____	
c. Pond bottom uniformity	Yes ____	No ____	NA
d. Pond sealing	Yes ____	No ____	
e. Erosion protection	Yes ____	No ____	

17. Is service bypass provided? No Discharge to Tile.

Howard R. Green Company
CONSULTING ENGINEERS

May 1, 1985

Akanad Koshy
Construction Permit Section
Iowa Department of Water, Air & Waste Management
Henry A. Wallace Building
900 East Grand
Des Moines, IA 50319

Re: Proposed Lagoon Modification
Plans & Specifications
Colony Village Restaurant
Interchange I-80, Iowa County
Project No. F-83-21

Dear Mr. Koshy:

We are enclosing four (4) sets of plans and specifications for the proposed Lagoon Modification which Preliminary Report was submitted to IDWAWM in November, 1982 and approved February 2, 1983.

As can be noted from the plans and specifications, two changes have been made since the Preliminary Report.

1. The aeration basin configuration has been changed to a single cell with a floating baffle provided to establish the quiescent cell. We would ask for a variance for the single aeration cell proposal and for the use of the floating baffle concept. The variance request is based upon the following justification.

   a) Installation of a floating baffle (or any baffle) in the existing lagoon to provide two aeration cells would, in our estimation, prove detrimental to the process. As can be noted, the flow is only 10,000 gals/day, or less than 10 gpm. With this low flow, and less than a water tight baffle, flow would tend to short circuit to the quiescent cell, leaving the second cell with little flow through and effectively cutting the aeration time in half.

4250 Glass Rd., N.E. • P.O. Box 9009 • Cedar Rapids, Iowa 52409 • Phone 319/395-7805

Colony Village Motel, Iowa County

5/15/85 Variance request was discussed with FE and LH. Then handed to LH for consultation with Joe Ober.

5/15/85 Engineer Contacted me. Discussed about the project before any review. Engineer was informed that I will have to discuss the Variance Horse power requirement with Lavoy Haugo and Joe Ober. During the discussions Engineer Bob Fredericks stated in strong terms "Whether you issue the permit or not we are going to do it".

He is of the opinion that the aeration requirement will be changed in the Design Standards

---

5/30/85 ① Drafted Variance request approval letter. Handed to LH for review - LH reviewed - Handed for typing.

② Discuss the review comments with FE before contacting Engineer. Did discuss with FE. Items on page 1-2 and 1-5 to be discussed with Engineer via phone.

5/30/85 2:30pm Tried to contact Engineer. He was out of the office. will get back to me.

T.C. Engineer 5/30/85 at 2:15pm.

Revise Plans, Specs and schedule K2

RECORD COPY

File Name Colony Village Restaurant - Sewage
Amana Intr. Change I-80

Senders Initials [illegible]

STATE OF IOWA
DEPARTMENT OF WATER, AIR, AND WASTE MANAGEMENT
HENRY A. WALLACE BUILDING
DES MOINES, IOWA 50319

CONSTRUCTION PERMIT

Colony Village Restaurant
Amana Interchange at I-80
Williamsburg, Iowa 52361

Permit No.: 85-143-S

File: Colony Village Resturant - Sewage
Amana Interchange at I-80 Iowa County
Re: Modification of the Lagoon System

WAWM Project No.: S83-21

In accordance with the provisions of Sections 455B.173.9 and 455B.174.4, Code of Iowa, and Rule 900--64.2(455B) or Rule 900--65.5(455B), or Rule 900--41.12(455B) of the Iowa Administrative Code, the Executive Director of the Department of Water, Air and Waste Management does hereby issue a permit for the construction of:

The modification of the existing single lagoon controlled discharge lagoon system to a two cell aerated lagoon continuous discharge system.

By the issuance of this permit, the permittee is granted variance to use curtain walls to seperate the aerated pond and quiescent cell and to construct a single aerated pond and a quiescent cell instead of two aerated ponds and quiescent cell as approved after review of the preliminary engineering report.

The wastewater treatment facility approved under this construction permit is designed to treat an organic loading of 26 pounds of BOD_5 per day while handling an average daily hydraulic loading of 10,000 GPD. The facility has been designed to meet the effluent limitations of:

Parameter	Daily Ave.	Maximum
Biochemical Oxygen Demand (5-day)	30 mg/l	45 mg/l
Suspended Solids	80 mg/l	120 mg/l
pH	Minimum 6.0	Maximum 9.0

A monthly average removal of 85% is also required.

The construction of the project shall be initiated within one year of issuance of this permit or this permit is no longer valid. Within thirty days after completion of construction, the permit holder shall submit a certification by a registered professional engineer that the project was completed in accordance with the approved project documents.

Pursuant to Section 455B.174.4, Code of Iowa, you have the right to appeal any condition of this permit by filing with the Executive Director of the Department of Water, Air and Waste Management a notice of appeal and request for administrative hearing within thirty days of receipt of this permit.

Contact Akanad M. Koshy at 515/281-8960 with any questions or comments.

For the Department of Water, Air and Waste Management:

Stephen W. Ballou, Executive Director

By: Larry Haage
PROGRAM OPERATIONS DIVISION

Date: June 25, 1985

cc: Howard R. Green Company, Cedar Rapids, IA
County Board of Supervisors, Iowa County, IA
County Board of Health, Iowa County, IA
Iowa Department of Health, LOCAL
WAWM Region 6

AMK:pla/WWPW198M01.01

Distribution

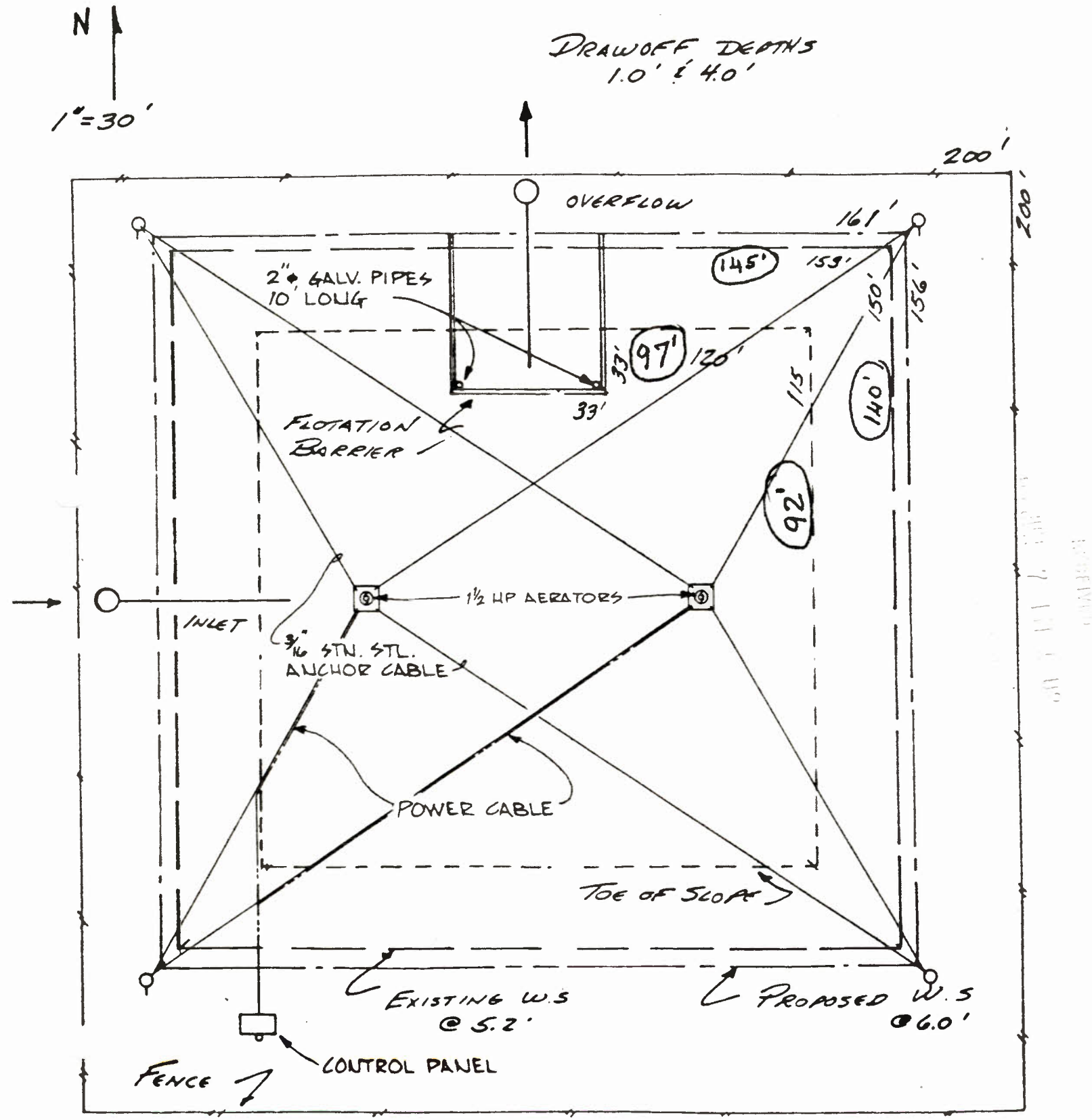
1 Engineer; 1 Region; 1 WAWM File

Date Prepared
Date Revised 4-29-85

IDEQ-C&WQ
Project No. F-83-21

Schedule H1 - Schematic Flow Diagram

Project Identity Colony Village Restaurant - Amana Interchange I-80



Date Prepared _____
Date Revised 4-29-85

IDEQ-C&WQ
Project No. F-83-21

Schedule K2 - Aerated Pond

1. Project Identity Colony Village Restaurant - Amana Interchange I-80

Design Basis:	AWW	MWW	PHWW
Flow, MGD	.01	.015	
BOD_5, #/Day	26.0	26.0	

2. No. of soil borings taken NA. Data included in the existing lagoon.
High groundwater elevation (MSL) 10 feet below bottom.

3. Top of dike elevation (MSL) NA ft. 100 year flood elevation (MSL) NA ft.

4.

Pond Data	Cell 1	Cell 2	Cell 3	Cell 4	Total
Surface area @ maximum depth (A)	.54	.02			.56
Maximum operation depth (ft)	6.0	6.0			
Minimum operation depth (ft)	5.2	5.2			
Effective storage volume (MG)	.84	.02			.86
Effective detention time (days)	86	2			88
Air Requirements:					
Provided (ft^3/#BOD)					
Provided ($\#O_2$/#BOD)	1.5				
Required ($\#O_2$/#BOD)	1.1				
Minimum D.O. level (mg/l)	1.0				
Freeboard @ maximum depth (ft)	2.0'	2.0'			
Top width of dike (ft)	5.0	5.0			
Inner embankment slope H/V	4:1	4:1			
Outer embankment slope H/V	4:1	4:1			
Type of inlet	6" CIP	CURTAIN			
Top drawoff level (ft)	4.0'	4.0'			
Middle drawoff level (ft)					
Bottom drawoff level (ft)	1.0	1.0			

5. Aeration Equipment: Design Air Temperature 100 °F to ____ °F.
Type surface aerator. Manufacturer & Model Airolator-SA-15-1
No. of Units 2. HP or CFM/unit 1.5 HP Total HP or CFM 3.0 HP.
K value .06 /day at design temperature 1 °C
Is a layout of the aeration system given on Schedule H1? Yes X No ____.

6. Is cold weather protection provided? Yes How? Submerged motor.

7. Method of raw flow diversion to cells None.

8. Method of interconnection of cells Flotation curtain opening to final cell.

9. Provision to prevent drawoff of floating solids Submerged outlet.

10. Method of sampling None - grab.

11. Type of flow measurement Water meters Location Well supply.

12. Fence Height 42" No. strands of barbed wire: Top 1 Bottom ____.

13. Number of warning signs 4. Location all four sides.

14. Will pond be pre-filled to 2 ft. level? Yes ____ No ____ Already Filled

15. Maximum allowable leakage rate NA in/day.
Method of testing leakage rate ____.

16. Are specifications included for:

a.	Seeding	Yes ___	No ___	
b.	Soil sterilization	Yes ___	No ___	
c.	Pond bottom uniformity	Yes ___	No ___	NA
d.	Pond sealing	Yes ___	No ___	
e.	Erosion protection	Yes ___	No ___	

17. Is service bypass provided? No Discharge to Tile.

RECEIVED
JUL 7 1 1985

[illegible] Department of [illegible]
Chemicals and Water Quality Division
Wastewater Collection and/or Treatment Facility Construction Permit Application
Schedule A - General Information

Engineering Firm: Howard R. Green Company
Project Officer: R.A. Frederick
Address: P.O. Box 9009, Cedar Rapids, IA 52409
Telephone: 319/395/7805

For Department Use Only
Project No.
Facility No.
Grant No.

Applicant: Colony Village Restaurant Authorized Repr: Howard R. Green Co.
Address: Amana Interchange - I-80 Telephone: / /
Project Identity: Single Cell Lagoon Modification with Air
Identify all categories included in this project and the applicable schedules submitted:

Schedule	Title	Included	Submitted
B	Collection System		
C	Lateral Sewer Extension		
D	Trunk & Interceptor Sewer		
E	Wastewater Pump Station		
F	Treatment Project Site Selection		
G	Treatment Project Design Data	X	X
H1	Schematic Flow Diagram	X	X
H2	Treatment Process Removal Efficiency		
H3	Mechanical Plant Reliability		
I	Screening, Grit Removal & Flow Measurement		
J	Septic Tank System		
K1	Controlled Discharge Pond		
K2	Aerated Pond	X	X
K3	Anaerobic Lagoon		
L	Settling Tanks		
M	Fixed Film Reactor-Stationary Media		
N	Rotating Biological Contactor		
O	Aeration Tanks or Basins		
P	Gas Chlorination		
Q	Sludge Digestion and Holding		
R1	Sludge Dewatering and Disposal		
R2	Low Rate Land Application of Sludge		
S	Irrigation/Land Application		

1. Identify any categories included in this project which are not provided in the above table: _____
2. Has an engineering report, facility plan or other information previously been submitted for this project? Yes ____ No X If yes, identify submitted with enclosed.
   Have there been any changes in project since DEQ approval of the engineering report or facility plan? Yes NA No ____. Is a list of the changes attached? Yes ____ No ____
3. No. of plans submitted 4 No. of specifications submitted ____. Approved standard specifications of _____.
4. Is Sewage Treatment Agreement included? Yes ____ No ____ Not Applicable X.
5. Does each copy of report, plans & specifications contain engineering certification? Yes
6. Is any overflow, bypass pipe or drain proposed which can result in discharge of raw or partially treated sewage to a watercourse? Yes ____ No X.
7. Is this a joint water supply and wastewater project? Yes ____ No X.
8. Construction inspection will be provided by Engineer.
9. Are any facilities such as public or private water supply wells, recreation areas or similar facilities located in proximity to any construction proposed? Yes ____ No NA
   If yes, are they identified on the plans? Yes ____ No ____ If not, attach data.
10. Estimated construction completion date May, 1983.

I hereby certify that all aspects of design included in this application conform to all applicable standards contained in the Chemicals and Water Quality Design Manual or GLUMRB "Recommended Standards for Sewage Works", or that an explanation and justification for any proposed variation from such standards is attached to this application. I am familiar with the information contained in this application, and to the best of my knowledge, such information is true, complete and accurate.

RA Frederick — 5902 — November 8, 1982
Signature — Registration # — Date
Robert A. Frederick, P.E.

UQ 133-A (1/79)

Date Prepared _____
Date Revised _____

IDEQ-C&WQ
Project No. _____

Schedule G - Treatment Project Design Data

1. Project Identity Colony Village Restaurant - Amana Interchange I-80
2. Project Description Single Cell Lagoon Modification with Air

3. Design Basis:

Plant Design Loading		Present ADW	Present AWW	Present MWW	Design Year (1983) ADW	Design Year (1983) AWW	Design Year (1983) MWW
Residential Waste	Population						
	Flow, MGD						
	BOD_5, #/day						
	TKN, #/day						
Out of Town Students	Number						
	Flow, MGD						
	BOD_5, #/day						
	TKN, #/day						
Industrial	Flow, MGD						
	Rated Flow, MGD						
	BOD_5, #/day						
	TKN, #/day						
Other (Specify)	Flow, MGD				10,000		15,000
	Rated Flow, MGD				NA		NA
	BOD_5, #/day				26.0		26.0
	TKN, #/day				NA		NA
Infiltration	MGD				NA		NA
Inflow	MGD				NA		NA
Total	Flow, MGD				10,000		15,000
	Rated Flow, MGD				10,000		15,000
	BOD_5, mg/l				311		208
	BOD_5, #/day				26.0		26.0
	TKN, mg/l				NA		NA
	TKN, #/day						

4. Peak Hourly Dry Weather Flow .015 MGD + Peak Hourly Infiltration 0 MGD + Peak Hourly Inflow 0 MGD = Total Peak Hourly Wet Weather Flow .015 MGD (In Design Year)

5. Identify effluent limitations

		BOD-5 day Avg	BOD-5 day Max	Susp Solids Avg	Susp Solids Max	NH_3-N Avg	NH_3-N Max				
Operation Permit	mg/l	30	45	80	120	NA	NA				
Effluent Limits	#/day	2.5	3.8	6.7	10.0						
Design Effluent	mg/l	25	38	75	112						
Quality	#/day	2.1	3.1	6.3	9.5						

6. Identify significant industrial/commercial contributors:

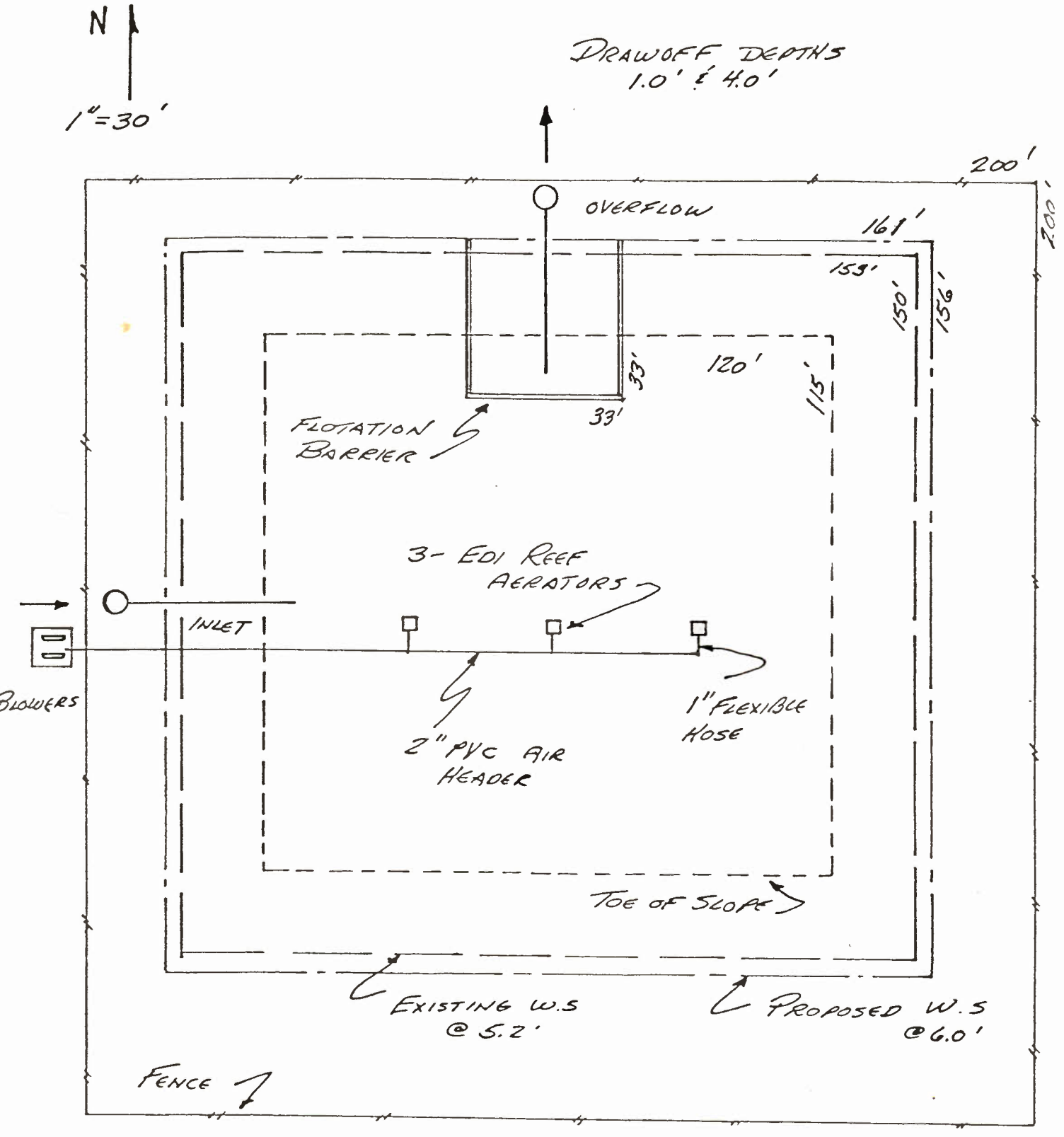
Waste Contributors	Pre-treat	Operation Hrs/Day	Operation Days/Week	Design Loadings Flow MGD Total	Flow MGD Rated	BOD_5 #/day	Susp. Solids #/day	TKN #/day	Oil & Grease #/day	#/day	#/day

Date Prepared _____
Date Revised _____

IDEQ-CBWQ
Project No. _____

Schedule H1 - Schematic Flow Diagram

Project Identity Colony Village Restaurant - Amana Interchange I-80



Date Prepared _____
Date Revised _____

IDEQ-C&WQ
Project No. _____

Schedule K2 - Aerated Pond

1. Project Identity Colony Village Restaurant - Amana Interchange I-80

Design Basis:	AWW	MWW	PHWW
Flow, MGD	.01	.015	
BOD_5, #/Day	26.0	26.0	

2. No. of soil borings taken NA. Data included in the existing lagoon.
High groundwater elevation (MSL) 10 feet below bottom.

3. Top of dike elevation (MSL) NA ft. 100 year flood elevation (MSL) NA ft.

4.

Pond Data	Cell 1	Cell 2	Cell 3	Cell 4	Total
Surface area @ maximum depth (A)	.27	.27	.02		.56
Maximum operation depth (ft)	6.0	6.0	6.0		
Minimum operation depth (ft)	5.2	5.2	5.2		
Effective storage volume (MG)	.42	.42	.02		.86
Effective detention time (days)	43	43	2		88
Air Requirements:					
Provided (ft^3/#BOD)					
Provided (#O_2/#BOD)	1.5	1.5			
Required (#O_2/#BOD)	1.1	1.1			
Minimum D.O. level (mg/l)	1.0	1.0			
Freeboard @ maximum depth (ft)	2.0'	2.0'	2.0		
Top width of dike (ft)	5.0	5.0	5.0		
Inner embankment slope H/V	4:1	4:1	4:1		
Outer embankment slope H/V	4:1	4:1	4:1		
Type of inlet	6" CIP	CURTAIN	CURTAIN		
Top drawoff level (ft)	4.0'	4.0'	4.0		
Middle drawoff level (ft)					
Bottom drawoff level (ft)	1.0	1.0	1.0		

5. Aeration Equipment: Design Air Temperature -20 °F to 100 °F.
Type Diffused. Manufacturer & Model Environmental Dynamics-Edi Reef.
No. of Units 3. HP or CFM/unit 15 cfm Total HP or CFM 45 cfm.
K value .06 /day at design temperature 1 °C
Is a layout of the aeration system given on Schedule H1? Yes X No ____.

6. Is cold weather protection provided? Yes How? Submerged.

7. Method of raw flow diversion to cells None.

8. Method of interconnection of cells Flotation curtain opening.

9. Provision to prevent drawoff of floating solids Submerged outlet.

10. Method of sampling None - grab.

11. Type of flow measurement Water meters Location Well supply.

12. Fence Height 42" No. strands of barbed wire: Top 1 Bottom _____.

13. Number of warning signs 0. Location _____.

14. Will pond be pre-filled to 2 ft. level? Yes ____ No ____ Already Filled

15. Maximum allowable leakage rate NA in/day.
Method of testing leakage rate _____.

Are specifications included for:

a.	Seeding	Yes ___	No ___	
b.	Soil sterilization	Yes ___	No ___	
c.	Pond bottom uniformity	Yes ___	No ___	NA
d.	Pond sealing	Yes ___	No ___	
e.	Erosion protection	Yes ___	No ___	

17. Is service bypass provided? No Discharge to Tile.

Re: Proposed Lagoon Modification
Plans & Specifications
Colony Village Restaurant
Interchange I-80, Iowa County
Project No. F-83-21

b) The formula for detention time determination as shown in 18C.6.2.1 is based upon the single cell concept. This we have used to determine our required 83 days. However, if this formula was used for two cells, the detention time requirement would drop to 37 days.

c) For a cost comparison ratio, we feel the proposed two cell system will perform as well, or even better, than other cell with baffle wall. The elimination of the baffle wall will save 130 feet of 6 ft. deep floating baffle or around $3,000.00. The comparison ratio of proposed cost would be $3,000/$0 or an infinite cost ratio.

d) We would also wish to note that the existing lagoon is currently loaded at an estimated 6,450 gpd and 21.5 lbs. The noted addition will only add 3,375 gpd and 4.5 lbs. of BOD. For the small additional loading (20%) we are adding aeration for the total load.

2. For the aeration system, we have proposed to use a floating surface aerator - Air-O-Lator. The unit will be 1.5 HP which will provide 4.5 lbs. oxygen/hour at standard conditions. For our Preliminary Report, only 2.6 lbs/hour are required. Therefore, ample oxygen will be provided to handle any diurnal loadings.

   As noted we plan to provide one installed aerator. To meet the reliability requirements we propose to purchase a spare motor and propeller which are the only two components of the aerator which would fail. We would estimate that either the spare motor or propeller could be replaced in less than 8 hours. Which is a minimal time when we have 83 days detention.

As also shown we have provided for warning sign on all four sides of the lagoon, and have added an extension modification to the outlet to raise the depth up to the 6.0 foot level.

Re: Proposed Lagoon Modification
Plans & Specifications
Colony Village Restaurant
Interchange I-80, Iowa County
Project No. F-83-21

As mentioned in our previous correspondence, the Owner plans to monitor raw flow with flow meters on the well supply.

We have also modified the Schedules K2 and H1, to reflect the above changes proposed, and would appreciate your earliest review and approval of the variance request and the plans and specifications.

Very truly yours,

Robert A. Frederick, P.E.

mp
enclosures

cc: Beltaine Assoc.