FORM 20105-0477
SOIL ABSORPTION TEST DATA REPORT
(Annex to Application)
(Reference: City Ordinance No. 9150 and County Resolution No. 2832)

LINCOLN-LANCASTER COUNTY HEALTH DEPARTMENT
Division of Environmental Health
2200 St. Marys Avenue
Lincoln, Nebraska 68502
Phone: 471-7800

B

FILE NO. _____

PROPERTY WHERE SOIL TESTED: 84th & Old Cheney

Location: Township _____; Range _____; Section & ¼ Section _____.
Property Dimensions: _____ ft. x _____ ft. Area: _____ acres. (Attach Sheet C with sketch of property).
Soil Type: Silty Clay ☐ ; Silty Clay Loam ☐ ; Sandy Loam ☐ ; Silt Loam ☐ ; Clay Loam ☐
Dates of Tests: 10-21-95 to 10-22-95. Weather: Precip. _____ Temp. _____.

OWNER: _____

Address: _____

PERCOLATION TEST DATA TABLE

a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.
		Pre-Saturation Period				Percolation Readings						Results	
		Start		End		Start			End				
Hold No.	Hole Depth (in.)	Date (Mo./Day)	Time (Hr./Min.)	Date (Mo./Day)	Time (Hr./Min.)	Date (Mo./Day)	Time (Hr./Min.)	Water Level (in.)	Time (Hr./Day)	Water Level (in.)	Elapsed Time (Min.)	Water Level Drop (in.)	Percolation Rates (Min./in)
1	36	10/21	11:00 AM	10/22	1:00 PM	10/22	1:00 PM	6"	1:40 PM	5 ¼	240	¾	80 MIN/IN
2	36	10/21	"	10/22	"	10/22	"	"	"	5"	"	1	60 MIN/IN
3	36	10/21	"	10/22	"	10/22	"	"	"	4⅞"	"	1⅛	53 MIN/IN
4	36	10/21	"	10/22	"	10/22	"	"	"	5½	"	½	120 MIN/IN
5	36	10/21	"	10/22	"	"	"	"	"	5¼	"	¾	80 MIN/IN
6	36	10/21	"	10/22	"	"		"		5⅛	"	⅞	69 MIN/IN

DeWayne Friesen
Signature of Person Conducting Test

Sum of Percolation Rates: _____
Average of Rates: _____
Mean of Rates: _____

Address _____ Phone 423-7076

(Do not write below this line)

REVIEWING ACTION

Remarks: _____
Soil Type (SCS): _____
Date: _____

Approved Percolation Rate (a)
A. _____ min./inch
B. _____ min./inch
C. _____ min./inch

_____
Signature of Reviewing Official

FORM 20102-0477
PRELIMINARY PLANS & SPECIFICATIONS FOR SEWAGE DISPOSAL SYSTEM (Annex to Application)
City Ordinance No. 9150 ☐
County Resolution No. 2832 ☐

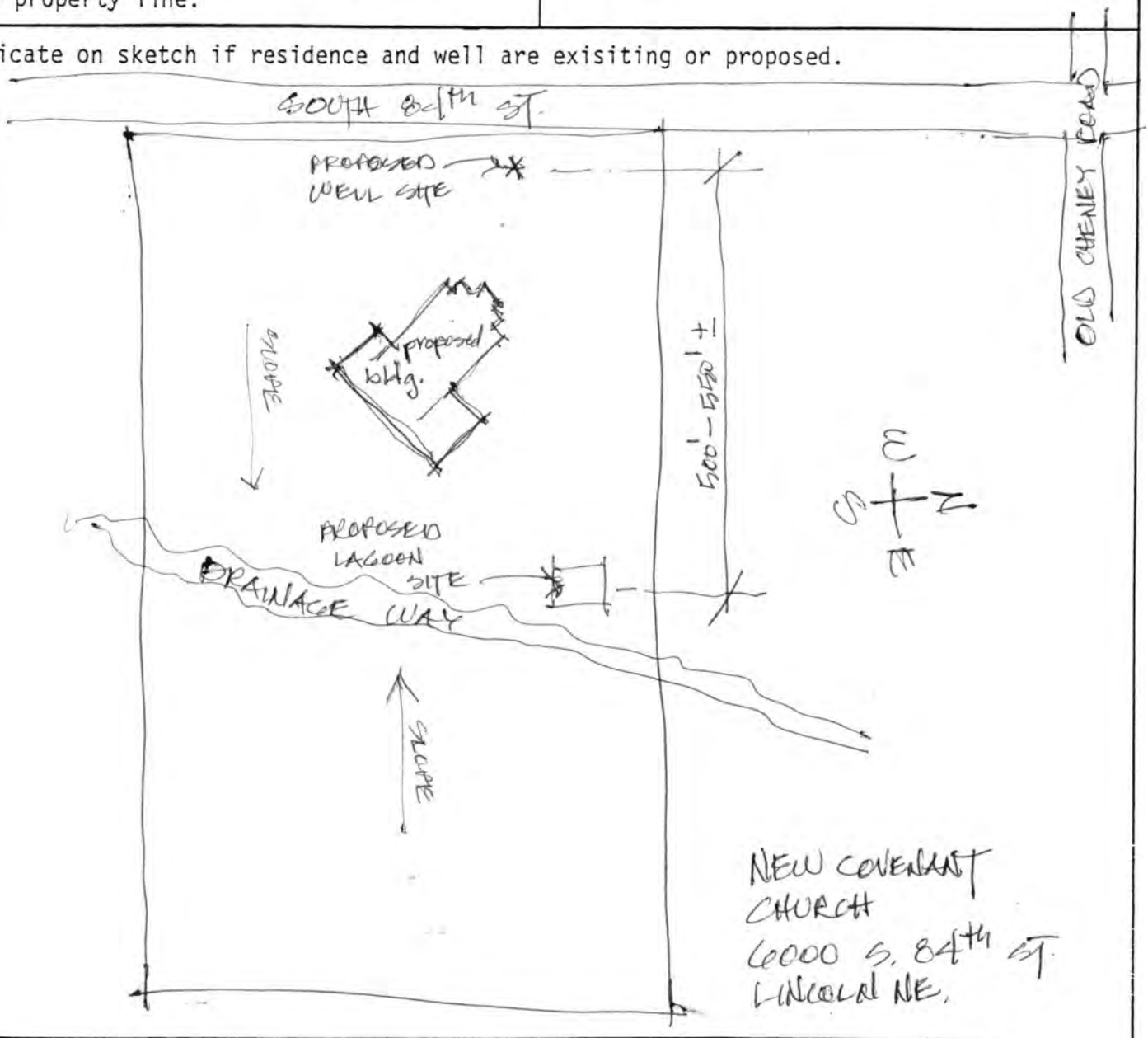
LINCOLN-LANCASTER COUNTY HEALTH DEPARTMENT
Division of Environmental Health
3140 N Street
Lincoln NE 68510
(402)-441-8022

C

Sketch of property showing Percolation Test hole locations, well, residence, direction and property line.

FILE NO. _____

Indicate on sketch if residence and well are exisiting or proposed.



REVIEWING ACTION

Remarks: MUST MEET DEQ REQUIREMENTS - JOINT APPROVAL

Date: _____

Minimum Design Requirement

1. Capacity of Septic Tank _____ gals.
2. Total Length of Laterals _____ ft.
3. With a Trench Width of _____ in.
4. Total Area of Lateral needed _____ sq.ft.

_____
Signature of Reviewing Official

LINCOLN-LANCASTER COUNTY HEALTH DEPARTMENT

ENVIRONMENTAL HEALTH DIVISION

3140 "N" STREET Lincoln, NE 68510-1514 (402) 441-8000

NON TRANSFERABLE

PERMIT

Permit
SEWAGE INSTALLATION

No. 96380141601

Issued 04/12/96
Expires 10/12/96
Revenue Code 18754

Establishment
JIM BERG
T9N R7E SEC 14
6000 S 84 STREET

FEES: $150.00

TOTAL $150.00

Permittee
JIM BERG
121 S 13 ST
SUITE 702
LINCOLN NE 68508

Issued By M. Jane Ford
Health Director

THIS LICENSE OR PERMIT IS ISSUED SUBJECT TO REVOCATION AS PROVIDED BY LAW "POST IN A PROMINENT PLACE"

FORM 20103-0477
REQUEST FOR SITE CLEARANCE AND PERMIT
FOR INDIVIDUAL SEWAGE DISPOSAL SYSTEM
City Ordinance No. 9150 ☒
County Resolution No. 2832 ☐

LINCOLN-LANCASTER COUNTY HEALTH DEPARTMENT
Division of Environmental Health
3140 N Street
Lincoln NE 68510
(402)-441-8022

441-8214

A

FILING FEE: $_____

FILE NO. _____

NEW CONV. CHURCH

DATE: 4.5.96

The undersigned hereby requests SITE CLEARANCE and PERMIT to construct an Individual Sewage Disposal System in conformance with appropriate resolution or ordinance, as described herein:

1. Legal description of property: Twp. 9N ; Range 7E ; Section 14 ; SW¼ OF NW¼
   Block _____ : Lot _____ : Addition _____
   Street Address 6000 S. 84th ST. LINCOLN, NE.
2. Property Use: Residential ☐ ; Commercial ☐ Other Use ☒
   No. of Bedrooms _____. Describe CHURCH
3. Type of Individual Sewage Disposal System: Septic Tank ☒ ; Other ☐
4. Distance to public sewer: ½ MILE ± ~~EX~~.

Signature of Applicant (Owner or Lessee)
JIM ROERIG - THE ARCHITECTURAL PARTNERSHIP
121 S 13TH ST SUITE 702
Address LINCOLN, NE. 68508

(Do not write below this double line)

1. Health Department: Date Rec'd. 4-10-96. Date Frwd. 4-10-96. ACTION: Approved ☒ Disapproved ☐ Signature: John E Mines
2. Supt. Bldg. Insp.: or Village Clerk: Date Rec'd. 4/10/96. Date Frwd. 4/10/96. ACTION: Approved ☒ Disapproved ☐ Signature: TK
3. City or County Engineer: Date Rec'd. 4-11-96. Date Frwd. 4-11-96. ACTION: Approved ☒ Disapproved ☐ Signature: RD Moham

REMARKS OR REASONS FOR DISAPPROVAL WELL WILL BE PUBLIC WATER SUPPLY AND AS SUCH WILL HAVE TO BE APPROVED BY STATE DEPARTMENT OF HEALTH.

Site Visits:
Date: _____ by: _____
Date: _____ by: _____
Date: _____ by: _____

INSTALLATION FINAL WRITTEN APPROVAL
Date: _____ By: _____

White: Health Dept. Copy
Yellow: Engineers Copy
Pink: Bldg. Inspector's Copy

FORM 23-43

Wastewater Treatment Facility

Preliminary Design Report

prepared for:

New Covenant Church

6000 South 84th Street

Lincoln , Nebraska

prepared by:

Erwin G. Kirkvold, P.E.

October 18, 1996

Wastewater Treatment Facility

Preliminary Design Report

prepared for:

New Covenant Church

6000 South 84th Street

Lincoln , Nebraska

prepared by:

Erwin G. Kirkvold, P.E.

October 18, 1996



Purpose - The purpose of this report is to document the basis for the design of the wastewater treatment facilities serving the church under construction for the New Covenant Church at 6000 South 84th Street. Lincoln, Nebraska.

Background - The New Covenant Church project was designed by The Architectural Partnership of Lincoln, Nebraska and consists of a sanctuary, gathering rooms, classrooms, offices, a kitchen and associated support facilities. A subsurface exploration and foundation evaluation was performed by Professional Service Industries, Inc.(PSI) of Omaha and documented in a report dated February 29, 1996.

Activities - The sanctuary has a seating capacity of 375. Initially, two(2) worship services are planned for Sunday mornings. Additionaly, there will be twelve(12) classroms with an estimated fifteen(15) students each. Tuesday evening, an Awana meeting is held for children five(5) to twelve(12) years of age with an expected attendance of one hundred (100). Another scheduled event is a monthly Wednesday night service with a potluck dinner attended by approximately three hundred(300) members. Numerous unscheduled events are held ie., weddings, parties,etc..

Expected Wastewater Flows - The wastewater composition is expected to be that of domestic wastewater. The source of water for the Church will be the City of Lincoln municipal water system. A City water main runs along the north property line. Average and peak flows were estimated taking into consideration the scheduled activities and the estimated numbers attending along with an estimate for unscheduled activities. The flows were estimated as follows:

average day = 401 gpd

peak day = 600 gpd (1.5 X average day)

This estimate was compared to the actual metered water usage of Southview Baptist Church which has facilities and a congregation similar to New Covenant Church. The metered water usage of Southview Baptist Church for the period of October 1995 to March 1996 according to the Lincoln Wastewater business office totaled 151 units. They define a unit as 100 cubic feet or 748 gallons. The average daily flow over the winter of 1995-1996 was 625 gpd. While the USEPA and many textbooks offer "average" water use numbers for various types of facilities, "hard" numbers from a comparable facility give us a higherlevel of confidence and we therefore propose to use the 625 gpd average flow for design purposes. It should be noted that this allows for a factor of saftey of 1.55 compared to the calculated flow.

Wastewater Treatment Facility - The proposed method of treatment is a complete retention lagoon. The PSI soils report showed the site soils to consist of Loveland loess overlaying glacial till with classifications of CL, CL-ML and CL-CH. These soils are not suitable for a soil absorbtion system as evidenced by percolation tests conducted in October 1995 (see appendix). Of the six(6) tests conducted, three(3) failed and three(3) were marginal. A complete retention lagoon provides a system that does not discharge by balancing the wastewater flows and precipitation with excess evaporation and a minimal amount of infiltration (seepage). A complete retention lagoon will provide a reliable wastewater facility for the New Covenant Church until the City extends sanitary sewer out to the area (1 to 2 years). The lagoon, however, is sized for a twenty year life using NDEQ guidelines.

Site Plan - Figure 1 shows the New Covenant Church property along with the neighboring properties. The location of the sewer and the lagoon are detailed on the attached plan sheets.

Soils Report - The attached PSI soils report has a boring log (B-7) near the proposed lagoon.The bottom and sides of the lagoon are down into a fat clay (glacial till). The boring log shows that no groundwater was encountered to a depth of 20.5 feet. This places groundwater at least ten (10) feet below the bottom of the lagoon cell. The soil classification is CL-CH and properly compacted to a 95% Standard Proctor Density with a moisture content at or up to four (4) percent over optimum, these soils will provide a seepage rate less thanthe 1/8 inch per day allowed.

Sizing - The complete retention lagoon is sized as follows:

Q = 625 gpd = 83.56 cft/ day = 30,498 cft / year
T = 20 years = 7,300 days
L = Precip. - Evap. - Seepage
= 28"-44"-(1/16")(365)
= 38.8 " / year = 3.23 ft / year
Depth = 5 feet
A = Area, sq. ft. (at high water level)

QT = (LT+D)A

(30,498)(20) = ((3.23)(20)+5)A
A = (30,498)(20)/((3.23)(20)+5)
= 609,960/69.6 = 9,442 sq. ft.

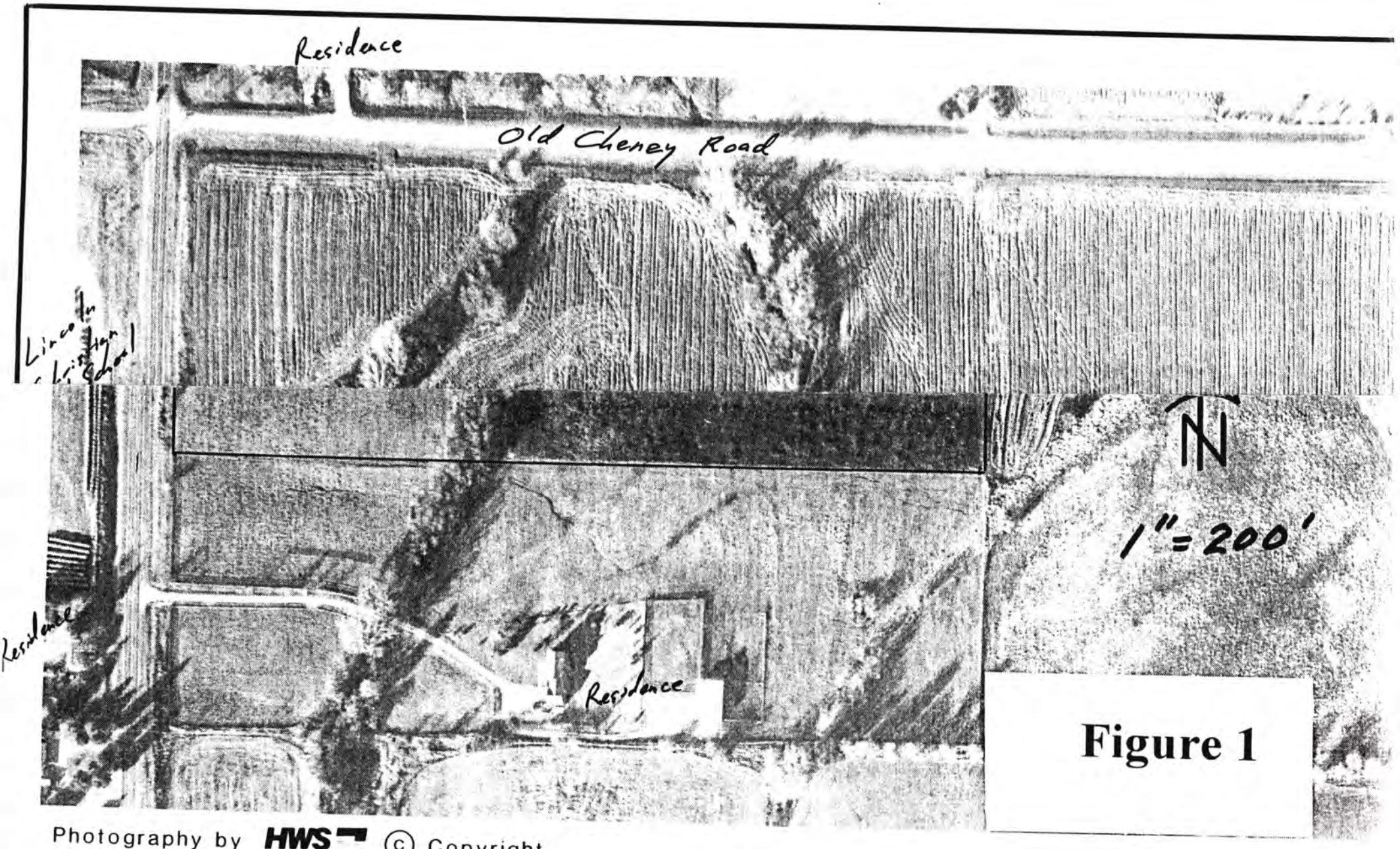
use 98' X 98'

10/12/96

New Covenant Church
Lagoon Sizing - Time vs. Operating Depth

Assume: Q = 625 gpd = 83.56 cft / day
Dimensions @ full depth(5 ft.) = 98' X 98'
Precip. = 28" / year
Evap. = 44" / year
Seepage = 1/16" / day
Startup = mid-November
Starting depth = 2'

Month	Q,cft	Precip.,ft	Evap.,ft.	Seepage,ft	Depth	New Length,ft.
Start	0	0	0	0	2	74
Nov-96	2548.58	0.08556	0.13444	0.1588542	2.25767	76.0613
Dec-96	2548.58	0.08556	0.13444	0.1588542	2.49045	77.9236
Jan-97	2548.58	0.08556	0.13444	0.1588542	2.70243	79.6194
Feb-97	2548.58	0.08556	0.13444	0.1588542	2.89671	81.1737
Mar-97	2548.58	0.08556	0.13444	0.1588542	3.07575	82.606
Apr-97	2548.58	0.30333	0.47667	0.1588542	3.11705	82.9364
May-97	2548.58	0.30333	0.47667	0.1588542	3.15538	83.2431
Jun-97	2548.58	0.30333	0.47667	0.1588542	3.19099	83.5279
Jul-97	2548.58	0.30333	0.47667	0.1588542	3.22409	83.7927
Aug-97	2548.58	0.30333	0.47667	0.1588542	3.25488	84.0391
Sep-97	2548.58	0.30333	0.47667	0.1588542	3.28355	84.2684
Oct-97	2548.58	0.08556	0.13444	0.1588542	3.43471	85.4776
Nov-97	2548.58	0.08556	0.13444	0.1588542	3.57578	86.6062
Dec-97	2548.58	0.08556	0.13444	0.1588542	3.70781	87.6625
Jan-98	2548.58	0.08556	0.13444	0.1588542	3.83171	88.6537
Feb-98	2548.58	0.08556	0.13444	0.1588542	3.94824	89.5859
Mar-98	2548.58	0.08556	0.13444	0.1588542	4.05805	90.4644
Apr-98	2548.58	0.30333	0.47667	0.1588542	4.03728	90.2982
May-98	2548.58	0.30333	0.47667	0.1588542	4.01766	90.1413
Jun-98	2548.58	0.30333	0.47667	0.1588542	3.99912	89.993
Jul-98	2548.58	0.30333	0.47667	0.1588542	3.98163	89.853
Aug-98	2548.58	0.30333	0.47667	0.1588542	3.96511	89.7209
Sep-98	2548.58	0.30333	0.47667	0.1588542	3.94952	89.5962
Oct-98	2548.58	0.08556	0.13444	0.1588542	4.05926	90.4741
Nov-98	2548.58	0.08556	0.13444	0.1588542	4.16287	91.3029
Dec-98	2548.58	0.08556	0.13444	0.1588542	4.26085	92.0868
Jan-99	2548.58	0.08556	0.13444	0.1588542	4.35365	92.8292
Feb-99	2548.58	0.08556	0.13444	0.1588542	4.44166	93.5332
Mar-99	2548.58	0.08556	0.13444	0.1588542	4.52523	94.2018
Apr-99	2548.58	0.08556	0.13444	0.1588542	4.60468	94.8375
May-99	2548.58	0.08556	0.13444	0.1588542	4.6803	95.4424
Jun-99	2548.58	0.08556	0.13444	0.1588542	4.75234	96.0187
Jul-99	2548.58	0.08556	0.13444	0.1588542	4.82102	96.5682
Aug-99	2548.58	0.08556	0.13444	0.1588542	4.88658	97.0926
Sep-99	2548.58	0.08556	0.13444	0.1588542	4.94918	97.5935
Oct-99	2548.58	0.08556	0.13444	0.1588542	5.00902	98.0722



Photography by HWS © Copyright

Figure 1

Appendix

- Soil Absorbtion Test Data Report
- Professional Service Industries, Inc. - "Soils Exploration and Foundation Recommendations for the Proposed New Covenant Church, Lincoln, Nebraska"
- Construction Drawings

FORM 20105-0477
SOIL ABSORPTION TEST DATA REPORT
(Annex to Application)
(Reference: City Ordinance No. 9150 and County Resolution No. 2832)

LINCOLN-LANCASTER COUNTY HEALTH DEPARTMENT
Division of Environmental Health
2200 St. Marys Avenue
Lincoln, Nebraska 68502
Phone: 471-7800

B

FILE NO. _____

PROPERTY WHERE SOIL TESTED: 84th + Old Cheney

Location: Township _____; Range _____; Section & ¼ Section _____.
Property Dimensions: _____ ft. x _____ ft. Area: _____ acres. (Attach Sheet C with sketch of property).

Soil Type: Silty Clay ☐ ; Silty Clay Loam ☐ ; Sandy Loam ☐ ; Silt Loam ☐ ; Clay Loam ☐

Dates of Tests: 10-21-95 to 10-22-95. Weather: Precip. _____ Temp. _____

OWNER: _____

Address: _____

PERCOLATION TEST DATA TABLE

a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.
		Pre-Saturation Period				Percolation Readings						Results	
		Start		End		Start			End				
Hold No.	Hole Depth (in.)	Date (Mo./ Day)	Time (Hr./ Min.)	Date (Mo./ Day)	Time (Hr./ Min.)	Date (Mo./ Day)	Time (Hr./ Min.)	Water Level (in.)	Time (Hr./ Day)	Water Level (in.)	Elapsed Time (Min.)	Water Level Drop (in.)	Percolation Rates (Min./in)
1	36	10/21	11:00 AM	10/22	1:00 PM	10/22	1 PM	6"	1:40 PM	5¼	24 Hr	¾	80 MIN/IN
2	36	10/21	"	10/22	"	10/22	"	"	"	5"	"	1	60 MIN/IN
3	36	10/21	"	10/22	"	10/22	"	"	"	4⅞"	"	1⅛	53 MIN/IN
4	36	10/21	"	10/22	"	10/22	"	"	"	5½	"	½	120 MIN/IN
5	36	10/21	"	10/22	"	"	"	"	"	5¼	"	¾	80 MIN/IN
6	36	10/21	"	10/22	"	"		"		5⅛	"	⅞	69 MIN/IN
											"		

DeWayne Friesen
Signature of Person Conducting Test

Address _____ Phone 423-7076

Sum of Percolation Rates: _____
Average of Rates: _____
Mean of Rates: _____

(Do not write below this line)

REVIEWING ACTION

Remarks: _____

Soil Type (SCS): _____

Date: _____

Approved Percolation Rate (a)
A. _____ min./inch
B. _____ min./inch
C. _____ min./inch

_____
Signature of Reviewing Official

FORM 20102-0477
PRELIMINARY PLANS & SPECIFICATIONS FOR SEWAGE DISPOSAL SYSTEM (Annex to Application)
City Ordinance No. 9150 ☐
County Resolution No. 2832 ☐

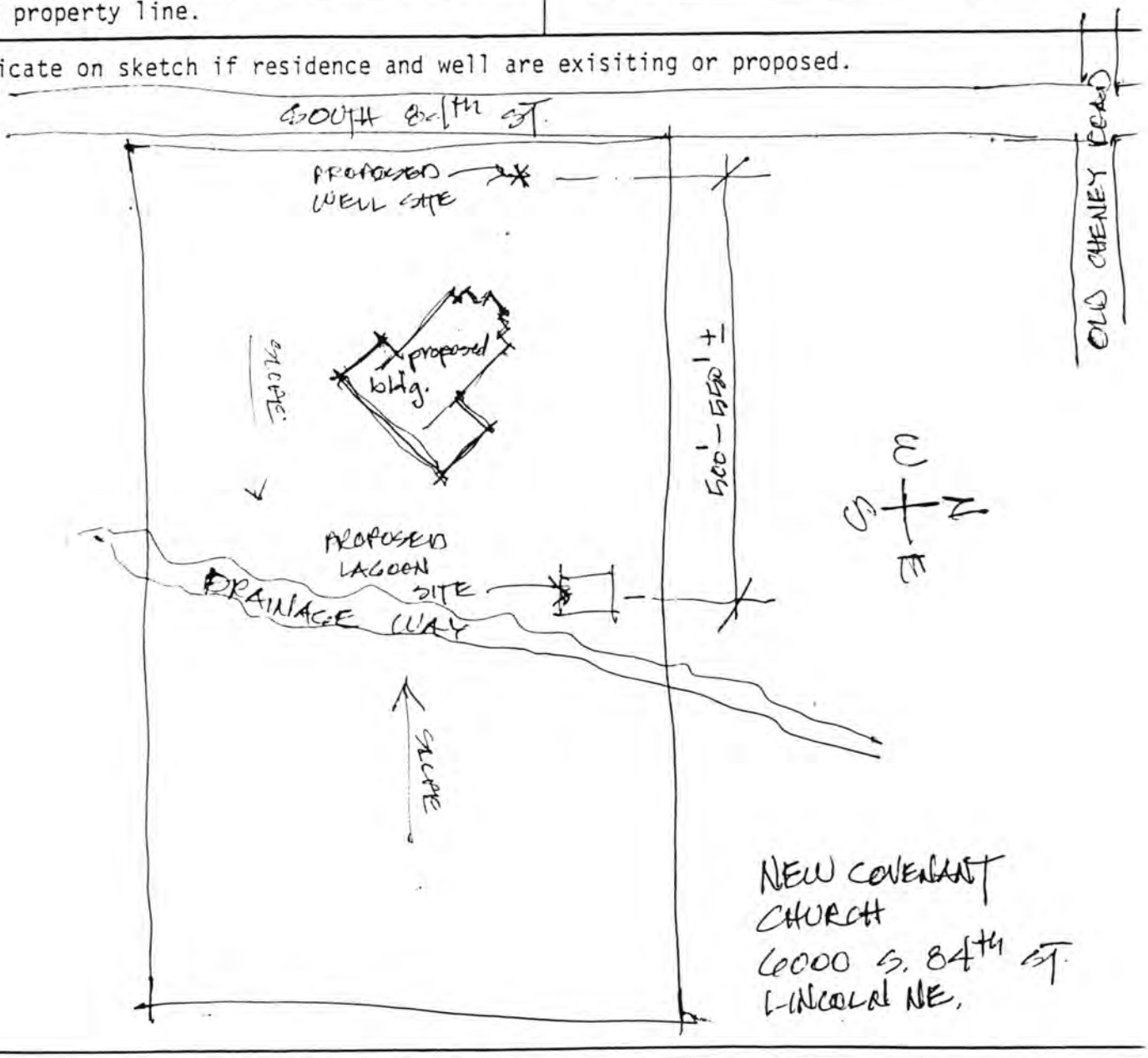
LINCOLN-LANCASTER COUNTY HEALTH DEPARTMENT
Division of Environmental Health
3140 N Street
Lincoln NE 68510
(402)-441-8022

C

Sketch of property showing Percolation Test hole locations, well, residence, direction and property line.

FILE NO._____

Indicate on sketch if residence and well are exisiting or proposed.



REVIEWING ACTION

Remarks : MUST MEET DEQ REQUIREMENTS - JOINT APPROVAL

Date:_____

Minimum Design Requirement
1. Capacity of Septic Tank_____gals.
2. Total Length of Laterals_____ft.
3. With a Trench Width of_____in.
4. Total Area of Lateral needed_____sq.ft.

_____
Signature of Reviewing Official

Professional Service Industries, Inc.

February 29, 1996

Mr. Bob Stephens
New Covenant Church
3701 O Street
Lincoln, Nebraska 68510

RE: Subsurface Exploration and
Foundation Evaluation for
New Covenant Church
Lincoln, Nebraska
PSI File Number 172-65015

Gentlemen:

In compliance with your instructions, Professional Service Industries Inc. has conducted a soils exploration and foundation evaluation for the above referenced project. The results of this exploration, concerning design and construction of the foundation and site grading, together with our recommendations, are to be found in the accompanying report, one copy of which is being transmitted herewith.

We appreciate the opportunity to have provided you with our geotechnical engineering services. Often, because of design and construction details which occur on a project, questions arise concerning soil conditions, and we would be pleased to continue our role as geotechnical engineers during the project implementation.

We would be pleased to assist you further by providing engineering and testing and inspection services during the construction of this project. If you will advise us of the appropriate time to discuss these engineering services, we will be pleased to meet with you at your convenience.

REGISTERED PROFESSIONAL ENGINEER
M. GARY LAUGHLIN
E-3052
STATE OF NEBRASKA

Very truly yours,

PROFESSIONAL SERVICE INDUSTRIES, INC.

M. Gary Laughlin

M. Gary Laughlin, P.E. - NE E3052
Chief Engineer - Geotechnical Services

James A. Bertsch, P.E. - NE E6985
District Manager

/ee
cc. The Architectural Partnership

2917 Douglas Street • Omaha, NE 68131-2600 • Phone: 402/341-5181 • Fax: 402/341-1526

PSI

SOILS EXPLORATION AND
FOUNDATION RECOMMENDATIONS
FOR THE PROPOSED
NEW COVENANT CHURCH
LINCOLN, NEBRASKA

PREPARED FOR

NEW COVENANT CHURCH

3701 O STREET

LINCOLN, NEBRASKA 68510

BY

PROFESSIONAL SERVICE INDUSTRIES, INC.

PSI NUMBER 172-65015

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SYNOPSIS

An exploration and evaluation of the foundation conditions have been made on the site of the proposed New Covenant Church in Lincoln, Nebraska.

Soil test borings have been drilled and the soil samples submitted to laboratory tests. The data has been carefully analyzed in light of the project information provided by The Architectural Partnership.

The subsoils encountered at the boring locations consisted of approximately two and one-half (2.5) to eight (8) feet of Eolian (wind blown) deposits underlain by glacial till. The upper two and one-half (2.5) feet of materials was frozen at the time of our field exploration. The Eolian deposits below the two and one-half (2.5) foot depths are stiff. The glacial materials were encountered at depths of ranging from zero (0) to eight (8) feet below the existing surface and are stiff to very stiff. Groundwater was observed at a depth of sixteen (16) feet at Boring Number 6, but was not observed in the other borings.

The proposed site grading indicates cuts up to ten (10) feet deep and fills up to approximately four (4) feet deep.

The results of the exploration and analysis indicate that conventional spread and continuous wall footings appear to be the most suitable type of foundation for the support of the proposed structure.

Net allowable soil pressures of 3000 P.S.F. may be used for continuous wall and isolated column footings placed on the stiff Eolian deposits, observed below the two and one-half (2.5) foot depths, on the glacial till or on the proposed engineered fill.

Conventional spread and continuous wall footings could be placed entirely on the glacial till material, with net allowable bearing pressures of 4500 P.S.F. to 5000 P.S.F.

The upper Eolian soils are suitable for the support of floor slabs. However, the deeper, more plastic materials are considered marginal because

of their higher potential for volume change. Recommendations for the preparation of the subgrade are included herein.

Detailed analyses of subsurface conditions, alternate foundation types and pertinent design recommendations are included herein. The final decision as to which foundation type will be used should be based on the design parameters given, costs, risk of foundation movement, and other factors beyond the scope of this study.

Proper site drainage and drainage behind the basement walls and floors will be very important in order to prevent free water from being trapped, resulting in increase lateral wall pressures, floor uplift pressures and volume change characteristics of the more plastic subsoils.

PSI cannot be responsible for the interpretation or implementation of this report by others. PSI should be retained to perform services sufficient to determine compliance with its recommendations. If PSI is not so retained, it will not accept any responsibility for the performance of the structure.

SUBSURFACE EXPLORATION
AND
FOUNDATION RECOMMENDATIONS

INTRODUCTION

This report presents the results of a soils exploration and foundation analysis for the proposed New Covenant Church conducted for the New Covenant Church.

Authorization

The work for the project was performed in accordance with our Proposal Number 172-010 dated January 22, 1996 and authorized by the New Covenant Church The proposal included a proposed scope of work, estimated cost, unit rates and PSI's general conditions.

Purpose

The purpose of this foundation exploration and analysis was to evaluate the soil and groundwater conditions at the site as they relate to the proposed construction, to determine some of the engineering characteristics of the subsurface materials encountered and to recommend a type and depth of foundation system suitable for the proposed structure as well as to provide a report which briefly outlines the testing procedures, describes the site and subsurface conditions and provides criteria for the architects and design engineers to use in preparing the foundation design.

Scope

The scope of the exploration and analysis included a review of geological maps of the area and a review of geologic and related literature, a reconnaissance of the immediate site, the subsurface exploration, field and laboratory testing, and an engineering analysis and evaluation of the foundation materials.

The scope of services did not include an environmental assessment for the presence or absence of wetlands or hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site. Any statements in this report or on the boring logs regarding odors, colors,

or unusual or suspicious items or conditions are strictly for the information of the client. Prior to purchase or development of this site, an environmental assessment is advisable.

General

The exploration and analysis of the foundation conditions reported herein are considered sufficient in detail and scope to form a reasonable basis for the foundation design. The recommendations submitted for the proposed New Covenant Church are based on the available soil information and the preliminary design details furnished by Mr. Bern Hottovy, representing The Architectural Partnership.

If there are any revisions in the plans for the proposed structure, or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI should be retained to determine if changes in the foundation recommendations are required. If PSI is not retained to perform these functions, PSI will not be responsible for the impact of those conditions on the performance of the structure.

The Geotechnical Engineer warrants that the findings, recommendations, specifications, or professional advice contained herein, have been presented after being prepared in accordance with generally accepted professional engineering practice in the fields of foundation engineering, soil mechanics and engineering geology. No other warranties are implied or expressed.

After the plans and specifications are more complete, it is recommended that the Geotechnical Engineer be provided the opportunity to review the final design and specifications, in order that the earthwork and foundation recommendations may be properly interpreted and implemented. At that time, it may be necessary to submit supplementary recommendations.

This report has been prepared for the exclusive use of the New Covenant Church and their designated consultants for the specific application to the proposed New Covenant Church.

DESCRIPTION OF SITE

Site Location

The site of the proposed New Covenant Church upon which this soils exploration has been made, lies on the east side of 84th Street, approximately 1300 feet south of Old Cheney Road in Lincoln, Nebraska.

Site Topography, Drainage and Vegetation

The site appears sloping, with an estimated thirty-six (36) feet difference in elevation between the west and east sides of the property. At the time of the exploration, the surface is covered by grass and the surface drainage appeared to be good with runoff into ditches crossing and adjacent to the site.

At the time the exploration was made, the surface of the site was frozen. The truck mounted drilling equipment experienced little difficulty in moving around the site.

GEOLOGY

General Area Geology

The area is plotted in the USDA Soil Conservation Service maps as Sharpsburg and Wymore series. These are Eolian (wind blown) deposits formed on uplands. The Eolian deposits are known to be underlain by glacial till which is in turn underlain by bedrock typically at depths greater than sixty (60) feet.

The subsoils identified typically exhibit low to very low permeability characteristics, moderate to high potential for volume change upon changing moisture and temperature conditions and are indicated to have moderate corrosion potential for concrete and moderate to high corrosion potential for steel.

FIELD EXPLORATION

Scope

The field exploration to determine the engineering characteristics of the foundation materials included a reconnaissance of the project site, making the borings, performing standard penetration tests, recovering

disturbed split-barrel and undisturbed thin-wall samples and performing hand penetrometer strength tests on the cohesive soil samples retained.

Seven (7) soil test borings have been drilled to depths ranging from ten and one-half (10.5) feet to thirty and one-half (30.5) feet below the existing ground surface. They were drilled in the locations determined by The Architectural Partnership and are indicated on the boring location plan provided in the Appendix which is a partial reproduction of the drawing provided by The Architectural Partnership. The test borings were located by the PSI driller using normal taping procedures and are presumed to be accurate to within a few feet. The apparent groundwater level was recorded in each boring after completion and the drill holes were backfilled with excavated soil.

Drilling and Sampling Procedures

The soil borings were performed with a drilling rig equipped with a rotary head. Six (6) inch diameter conventional continuous flight augers were used to advance the holes. Representative samples were obtained employing split-barrel sampling procedures in general accordance with the procedures for "Penetration Test and Split-Barrel Sampling of Soils" (ASTM D1586). Undisturbed samples were obtained using thin-wall sampling procedures in accordance with the procedures for "thin-walled tube sampling of soils" (ASTM D1587). The samples obtained by this procedure were extruded by a hydraulic ram and classified in the field. Samples were identified according to boring number and depth, and encased in polyethylene plastic wrapping to protect against moisture loss and transported to the laboratory in special containers.

Field Tests and Measurements

Penetration Tests - During the sampling procedures, standard penetration tests were performed at regular intervals to obtain the standard penetration values of the soil. The standard penetration value (N) is defined as the number of blows of a 140 pound hammer, falling thirty (30) inches, required to advance the split-spoon sampler one (1) foot into the soil. The sampler is lowered to the bottom of the drill hole and the number of blows recorded for each of three (3) successive increments of six (6) inches penetration. The "N" value is obtained by adding the second and third

incremental numbers. The results of the standard penetration test indicate the relative density and comparative consistency of the soils, and thereby provide a basis for estimating the relative strength of and compressibility of the soil profile components.

Strength Tests - During the field boring operations, samples of the cohesive soil from the split-barrel sampling device or from Shelby tube samples were frequently tested, using of a soil penetrometer as an aid in estimating the strength of the soil.

Water Level Measurements - Water level observations were made during the test boring operations and are noted on the test boring logs presented in the Appendix. In relatively pervious soils, such as sandy soils, the indicated elevations are considered reliable groundwater levels. In relatively impervious soils, the accurate determination of the groundwater elevation may not be possible even after several days of observations. Seasonal variations, temperature, land-use, and recent rainfall conditions may influence the depths to the groundwater. Volumes of water will depend on the permeability of the soils.

Ground Surface Elevations - The elevation of the ground surface shown on the plan of boring locations was determined by interpolation from a one (1) foot interval topographic plot of the site, provided by The Architectural Partnership and is presumably accurate to within ±0.5 feet.

LABORATORY TESTING PROGRAM

In addition to the field exploration, a supplemental laboratory testing program was conducted to determine additional pertinent engineering characteristics of the foundation materials necessary in analyzing the behavior of the proposed structure. The laboratory testing program included supplementary visual classification and water content determinations on all samples. In addition, selected samples were subjected to dry unit weight determinations (AASHTO T233).

The consolidation, rebound and swelling characteristics of the foundation soils at depths of nine (9) and ten and one-half (10.5) feet in

Boring Number 5 was evaluated by performing one (1) dimensional consolidation tests on undisturbed samples. The samples were obtained from the significant soil strata and tested in order to estimate the settlement of the proposed structures.

The shear strengths of the various cohesive soils were determined from unconfined compression tests on undisturbed samples obtained from thin-wall tube samplers.

All phases of the laboratory testing program were conducted in general accordance with applicable ASTM Specifications and the results of these tests are to be found on the accompanying boring logs located in the Appendix.

SUBSURFACE CONDITIONS

General

The types of foundation materials encountered have been visually classified and are described in detail on the Records of Subsurface Exploration (boring logs) located in the Appendix. The results of the field penetration tests, strength tests, water level observations and the laboratory tests are presented on the boring logs in graphical and numerical form. A key to descriptive terms and symbols used on the boring logs is also present in the Appendix. Representative samples of the soils were placed in sample jars or polyethylene plastic bags and are now stored in the laboratory for further analysis if desired. Unless notified to the contrary, all samples will be disposed of after two months.

The stratification of the soils, as shown on the Records of Subsurface Exploration (boring logs), represents the soil conditions in the actual boring locations, and variations may occur between the borings. Lines of demarcation represent the approximate boundary between the soil types, but the transition may be gradual, or not clearly defined.

It is to be noted that, whereas the test borings are drilled and sampled by experienced drillers, it is sometimes difficult to record changes in stratification within narrow limits.

Soil Conditions

A description of the soil will be found on the Records of Subsurface Exploration (boring logs) in the Appendix. The subsoils encountered at the boring locations consisted of topsoil, Eolian (wind blown) deposits and glacial till.

The topsoil was observed within the upper six (6) to twelve (12) inches at most of the borings and consists of dark grey lean clay which was not considered for support of foundations, slabs or area fills.

The Eolian deposits were encountered beneath the topsoil and persisted to the depths of two and one-half (2.5) to twelve (12) feet. This material consists of lean clay and sandy lean clay, altered loess and Loveland Aged Loess. This material is stiff below depths of approximately two and one-half (2.5) feet with the following test characteristics.

Dry Density, P.C.F.	90 to 102
Moisture Content, %	15 to 24
Saturation Condition, %	78 and 92
Unconfined Compressive Strength, T.S.F.	1.65 and 2.25
Hand Penetrometer Strength, T.S.F.	3.0 to 4.5
Standard Penetration Test (N value), B.P.F.	21
Unified Soils Classification	CL

The compressibility of this material is considered to be relatively low under the anticipated loadings.

The glacial deposits were encountered beneath the loess (Eolian) material and persisted to the depths explored. This material consists of sandy lean to fat clay or clayey sand. This material is stiff with the following test characteristics.

Dry Density, P.C.F.	104 to 111
Moisture Content, %	17 to 27
Saturation Condition, %	87 to 98
Unconfined Compressive Strength, T.S.F.	1.01 to 2.50
Hand Penetrometer Strength, T.S.F.	1.5 to 4.5
Standard Penetration Test (N value), B.P.F.	15 to 36
Unified Soils Classification	CL-CH or SC

The compressibility of this material is considered to be low under the anticipated loadings.

Groundwater Observations

Groundwater was encountered in Boring Number 6, at an approximate depth of twenty-six (26) feet. After a period of approximately one-half (0.5) hour, the measured water level was sixteen (16) feet below the surface.

The remaining borings were dry upon completion, indicating that the groundwater level at these locations at the time of the exploration was greater than twenty and one-half (20.5) feet below the existing ground surface, or that soils encountered were relatively impermeable and the groundwater levels had not stabilized in the bore holes.

It should be noted that groundwater levels on this site may vary due to seasonal conditions.

FOUNDATION DISCUSSION AND RECOMMENDATIONS

Project Description

Based upon the information provided, it is indicated that the proposed construction will consist of a two-story educational wing and a one-story assembly wing. We also understand that the lower floors will be concrete slabs on grade and all foundation footings and walls will be poured concrete. It is also understood that exterior walls above grade will be wood framed with brick facing, the upper floor under the education wing will be wood trusses and the sloped roofs will be wood trusses. We further understand that the basement elevation will be at about elevation 246 and upper floor at elevation 258. Based on our calculations it is anticipated that up to five (5) feet of fill will be required in the area of the assembly wing and cuts of four (4) to ten (10) feet in the education wing. Site development will include sidewalks and parking areas. Cuts in the parking lot will be from two (2) to eight (8) feet. Maximum concentrated footing loads will be 20 kips and maximum continuous footing loads will be 4.0 kips per lineal foot. The above information was provided by Mr. Bern Hottovy representing The Architectural Partnership, P.C.

If any of the above information should change significantly or be in error, it should be brought to our attention so that we may review the recommendations made in this report.

Engineering Analysis

The bearing capacity of the existing naturally occurring soil was evaluated from the results of the standard penetration tests, moisture content, dry density, hand penetrometer and unconfined compression test results, and the Unified Soils Classifications. These test results indicate that the existing naturally occurring soil has a moderate bearing capacity with respect to shear strength.

Foundation Discussion

The type and depth of foundation suitable for a given structure primarily depends on several factors; the subsurface conditions, the function of the structure, the loads it may carry and the cost of the foundation. Additional considerations may include acceptable performance criteria set by the owner, architect, or structural designer, with respect to vertical and differential movements which the structure can withstand without damage.

The recommendations presented in this report are based on the available data related to design loads, subsurface conditions encountered in the borings, and the laboratory test data. Various foundation types have been considered for support of the proposed structure. The foundation types recommended for support of the building are a shallow foundation system of continuous wall and isolated column footings. These are discussed in more detail in the following sections of this report. The foundation recommendations presented below assume that the site preparation and grading are performed in accordance with the "Construction Considerations" section of this report.

RECOMMENDED FOUNDATION TYPE

Recommendations

Considering the subsurface conditions and the proposed construction, the structure should be founded on conventional spread or continuous wall footing foundations. Estimated total settlements should not exceed one-half (0.5) inch if the following design and construction details are incorporated. If these recommendations are not followed, PSI cannot be responsible for the performance of the project.

The calculated settlements beneath the isolated twenty (20) kip column footing and the four (4) kip continuous wall footing is three-tenths (0.3) inch. The consolidation/settlement beneath the four (4) to five (5) feet of compacted fill is expected to be approximately four-tenths (0.4) inch. At least fifty (50) percent of the settlement beneath the area fill is expected to occur during the construction period. The maximum potential differential settlement in twenty (20) feet along any wall footing is expected to be one-fourth (0.25) inch or less and will be resisted by the reinforcement in the footings and concrete walls.

Footings should be placed on the existing stiff glacial tills, the stiff Loveland Loess or on new compacted fill as described in the site preparation section of this report. Continuous wall footings should be designed for a net allowable soil pressure of 3000 P.S.F. Any isolated interior footings may be designed for a net allowable soil pressure of 3000 P.S.F.

As an alternative, continuous and spread footings may be constructed entirely on the glacial material, and designed to exert net soil pressures of 4000 P.S.F. and 4500 P.S.F., respectively.

A modulus of subgrade reaction value of 180 is recommended based on the unconfined compressive strength test results.

Unsuitable bearing material may be encountered in the foundation excavation. If found, they should be removed and replaced with engineered fill as described in the site preparation section or the footings should be extended to bear on the underlying higher strength soils. This decision should be made by Professional Service Industries at the time of construction.

Extreme care should be taken to prevent the weakening or heaving of the foundation bearing materials because of prolonged atmospheric exposure, construction activity disturbance or an increase in moisture content. In the event that an overnight delay in concrete placement is anticipated, the footing excavations should be protected from moisture change.

All perimeter footings must be placed at a depth of at least 3'6" below the finished grade in order to protect them from frost action.

Interior footings not subject to frost action, excessive shrinking or swelling may be placed at a shallow depth of at least eighteen (18) inches below the floor slab, providing they will be bearing on acceptable soils. If they bear on compacted fill, this fill must be placed in accordance with the requirements described elsewhere in this report. Shallow footings must be protected from the effects of frost action if construction is carried out during the winter months.

In order to reduce the effects of differential movement that may occur due to variations in the character of the supporting soils and any variations in seasonal moisture contents, it is recommended that all continuous footings be suitably reinforced.

Footings supporting individual columns should have a minimum dimension of twenty-four (24) inches, and continuous footings should have a minimum width of sixteen (16) inches, even if that dimension gives a bearing pressure less than the allowable. The purpose of limiting the minimum footing size is to prevent a "punching" shear, to provide for vertical stability and to reduce the possibility of bearing on an isolated weak zone.

Summary

When the foundation types discussed herein are considered, conventional spread and continuous wall footings are recommended for use as foundations for the proposed structure. Design parameters for each have been presented in this report. The final choice of foundation type should be based on the relative economics of each, engineering and construction advantages, considered in light of the planning and design of the proposed structure and the amount of structural inconvenience that can be tolerated, keeping in mind the risks associated with any type of foundation. For further discussion of these factors, contact Professional Service Industries Inc.

Floor Slab-On-Grade

Care must be taken so that all excavations made for the foundations are properly backfilled with suitable material compacted in accordance with the procedures outlined. Before the backfill is placed, all water and loose debris should be removed from these excavations.

Prior to the placing of concrete floors or pavements on this site, or before any floor supporting fill is placed, the excessively organic, loose or obviously compressive materials must be removed. The subgrade should then be proof-rolled until the grade offers a relatively unyielding surface or until the specified degree of compaction has been achieved. Areas of excessive yielding should be excavated and backfilled with engineered backfill. Any surface area with slopes of four (4) horizontal to one (1) vertical or greater should be benched or stepped to prevent the fill section from slipping along the interface of the fill section and the original site grade.

Any fill used to increase the elevation of the floor slab or backfill should be a lean clay material with a liquid limit less than 45. It should be placed in layers of not more than eight (8) inches in thickness, at moisture contents from zero (0) to four (4) percent above optimum, and compacted to a minimum density of 95 percent of the maximum dry density as determined by the "Moisture Density Relations of Soils" Test, ASTM D698.

The existing shallow altered loess subsoils are considered suitable for use as the compacted fill. However, the Loveland Loess and glacial till material are more plastic and will have a tendency to exhibit greater volume change characteristics beneath floor slabs and pavements, especially within the frost zone.

A granular mat should be provided between the floor slabs and the subgrade soils. It should have a minimum thickness of six (6) inches and be properly compacted as recommended in this report. An impervious membrane should be provided as a vapor barrier beneath the slab.

The floor slab should be suitably reinforced to make it as rigid as possible. Proper joints should be provided at the junctions of the slab and foundation system so that a small amount of independent movement can occur without causing damage. Large floor areas should be provided with joints at frequent intervals to compensate for concrete volume changes during curing.

The moisture content of the compacted subgrade should be maintained near the compaction moisture until the concrete is placed.

Retaining Wall Design and Construction

Below-grade walls may be required to resist lateral earth pressures. These may include basement walls, loading dock walls and retaining or wing walls designed to accommodate surface grade changes around the building and parking areas or adjacent to truck ramps. The actual earth pressure on the walls will vary according to material types and backfill material used and how the backfill is compacted. The use of heavy compaction equipment and over compaction of fill next to walls may induce higher pressure than estimated herein.

The equivalent fluid unit weights tabulated below provide recommended lateral earth pressures for design of these walls. This table assumes that positive foundation drainage is provided to prevent buildup of hydrostatic pressure. The below-grade walls should be designed to resist an additional uniform lateral load of one-half of the floor or surface loads.

Backfill Type	Fixed-Headed Walls PCF	Free-Headed Walls PCF
Cohesive Soil	65	45
Granular Material	55	35

A fixed-headed wall is a wall connected to the floor slab or beams and not permitted to deflect at the top after backfilling. A free-headed wall is designed to deflect at the top and remain fixed at the base, such as a free-standing retaining wall. A wing-wall attached to a fixed-headed wall should be considered fixed-headed unless the structural design permits

independent rotation. Backfill of foundation walls and retaining walls may consist of low plastic soils or granular material. We recommend using granular material to provide improved drainage and reduce lateral pressure on the wall. If more plastic soils are used, the above indicated design lateral pressures would need to be much higher.

It is recommended that all below-grade walls and retaining walls be provided with a positive foundation drainage system. A typical below-grade wall drain would consist of a minimum four (4) inch flexible or rigid perforated drain pipe protected by a proper filter medium (clean, coarse granular fill) and a non-woven geotextile fabric (minimum four ounces per square yard). The foundation drain system would be tied to the storm drainage system, allowed to daylight downslope, or collected in a sump and pumped out. This system typically is installed directly on top of the foundation footing with the free draining filter medium extending approximately eighteen (18) inches behind the wall and to within two (2) feet of the final grade. The non-woven filter fabric is intended to encircle or wrap the entire system.

CONSTRUCTION CONSIDERATIONS

Site Preparation

Excessively organic topsoils and loose dumped or uncompacted fill materials generally undergo high volume changes when subjected to loads. This is detrimental to the behavior of pavements, floor slabs, structural fills and shallow foundations placed upon them. Therefore, it is recommended that excessively organic topsoils and loose dumped or uncompacted fill material, debris and other deleterious materials be stripped from these areas to depths of approximately six (6) inches to twelve (12) inches and wasted or stockpiled for later use. Exact depths of stripping, however, should be determined by a representative of Professional Service Industries in the field at the time stripping is carried out.

After the topsoil and loose fill materials, debris and other deleterious materials have been stripped, proper control of the placement and compaction of new fills should be maintained by a representative of the Geotechnical Engineer. The fill material should be a lean clay with a liquid limit less than 45, free of organic matter and be compacted to a minimum of

95 percent of the maximum dry density from zero (0) to four (4) percent above the optimum moisture content as determined by ASTM D698. A sufficient number of in-place density tests should be performed on each lift of the fill. The tests should be performed by a qualified Soils Technician under the supervision of the Geotechnical Engineer, in accordance with appropriate ASTM procedures.

Groundwater Control

Because of the relatively low water level measurements, no difficulty during excavation and construction of the proposed shallow foundation is anticipated.

However, because the foundation materials generally tend to soften and swell when exposed to free water, every effort should be made to keep the excavations dry of water from any source.

Safety Recommendations

Prior to the commencement of construction, the owner and the contractor should make themselves aware of and become familiar with applicable local, state, and federal safety regulations, including the current OSHA Excavation and Trench Safety Standards. Construction site safety generally is the sole responsibility of the contractor, who shall also be solely responsible for the means, methods, and sequencing of construction operations. We are providing this information solely as a service to our clients. Under no circumstances should the information provided herein be interpreted to mean that Professional Service Industries, Inc. is assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

Excavations

Shallow excavations into the existing material should be reasonably stable for short periods of exposure. However, it is noted that provisions for shoring and bracing of deep excavations are required by OSHA and other building codes.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. All excavations should comply with applicable local, state, and federal safety regulations including the current OSHA Excavation and Trench Safety Standards. Construction site safety generally is the sole responsibility for the means, methods, and sequencing of construction operations. We are providing this information solely as a service to our client. Under no circumstances should the information provided herein be interpreted to mean that Professional Service Industries, Inc. is assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations. Specifically, the current OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926 should be followed. It is our understanding that these regulations are being strictly enforced and if they are not closely followed, the owner and the contractor could be liable for substantial penalties.

The contractor's "responsible person, as defined in 29 CFR Part 1926", should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. If an excavation, including a trench, is extended to a depth of more than twenty (20) feet, it will be necessary to have the side slopes designed by a professional engineer registered in the state where construction is occurring.

For this site, the overburden soil encountered in our exploration is a stiff lean to fat clay. This is considered to be a type A soil when applying the OSHA regulations. OSHA recommends a maximum slope inclination of three-fourths (0.75) horizontal to one (1) vertical for type A soils.

The soils to be penetrated by the proposed excavation may vary significantly across the site. Our preliminary soil classification is based solely on the materials encountered in widely spaced exploratory borings. The

contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions are encountered at the time of construction, we recommend that Professional Service Industries, Inc. be contacted immediately to evaluate the conditions encountered.

Materials removed from the excavation should not be stockpiled immediately adjacent to the excavation, inasmuch as this load may cause a sudden collapse of the embankment.

Prior to the placing of concrete for the footings, the excavations should be inspected and approved by the Geotechnical Engineer. This is especially important where continuous footings are excavated with a trench machine. Where reinforcing steel is placed in the foundations, an inspection must be maintained to monitor that specified chairs or supports are provided and that the reinforcing is properly positioned, as specified.

Site Drainage

Water should not be allowed to collect near the foundations or floor slab area of the structure either during or after construction. Undercut or excavated areas should be sloped toward one corner to facilitate removal of any collected rainwater, groundwater, or surface runoff. All grades should be sloped away from the building and surface drainage should be collected and discharge such that water is not permitted to infiltrate the backfill of the foundation.

GENERAL COMMENTS

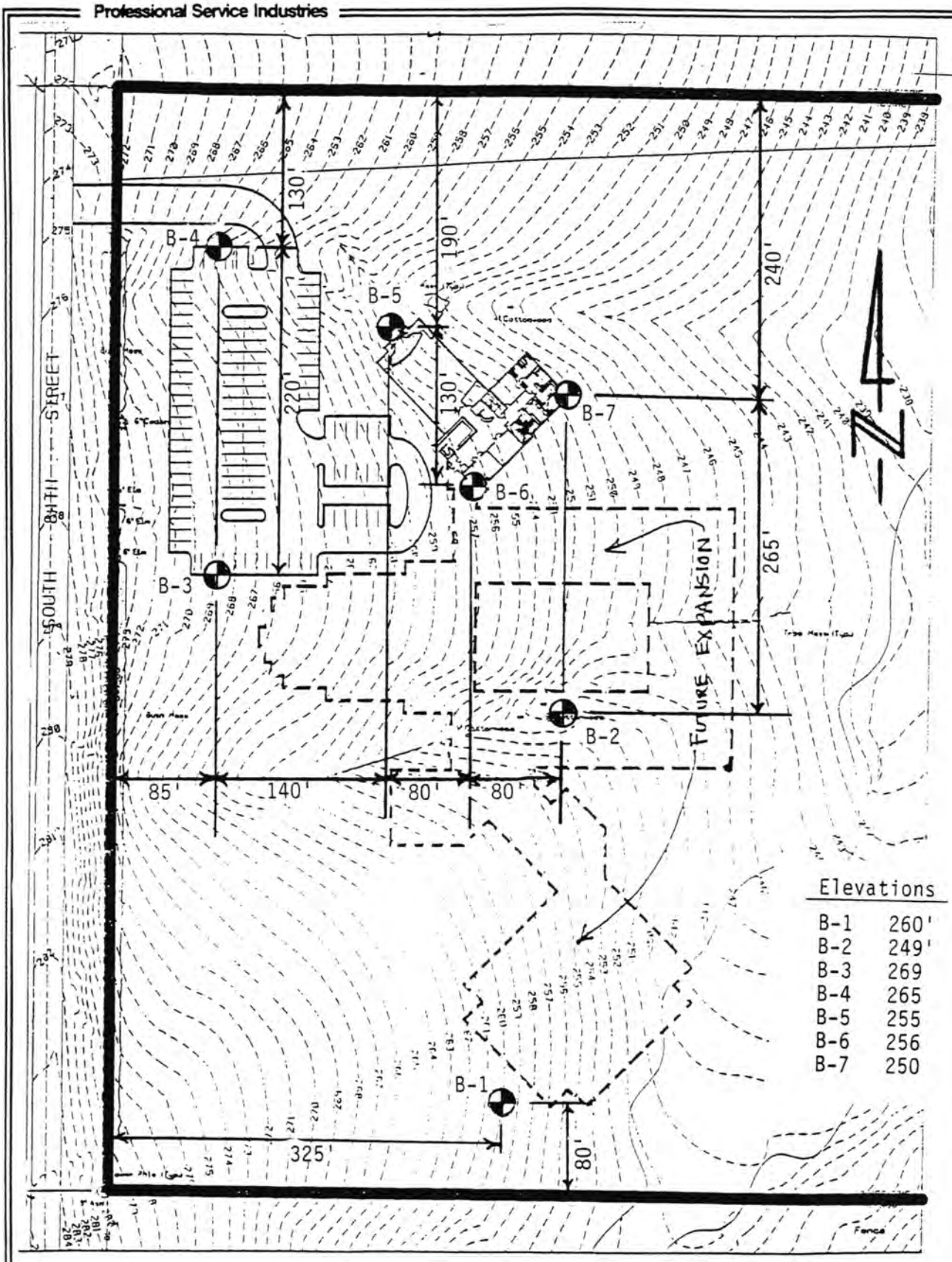
When the plans and specifications are more complete or if significant changes are made in the character or location of the proposed structure, a consultation should be arranged to review them with respect to the prevailing soil conditions. At that time, it may be necessary to submit supplementary recommendations.

It is recommended that the services of our qualified Geotechnical Engineer be engaged to test and evaluate the soils in the footing excavations prior to concreting in order to verify that the bearing soils are consistent with those encountered by the borings.

Monitoring and testing should also be performed by PSI personnel to verify that suitable materials are used for controlled fills and that they are properly placed and compacted.

All sheeting, shoring, and bracing of trenches, pits and excavations should be made the responsibility of the contractor and should comply with all current and applicable local, state and federal safety codes, regulations and practices, including the Occupational Safety and Health Administration.

APPENDIX



PROJECT NAME	PLAN OF BORING LOCATIONS	
Proposed New Covenant Church Lincoln, Nebraska	PROJECT NO 172-65015	DATE February 29, 1996

Professional Service Industries, Inc.
RECORD OF SUBSURFACE EXPLORATION

Boring: 1

Project Name: PROPOSED NEW COVENANT CHURCH Date of Boring: FEBRUARY 1, 1996

Site: LINCOLN, NEBRASKA Project No: 172-65015

DESCRIPTION	DEPTH ft.	SAMPLE	N	CLASS	Q_u tsf	Q_p tsf	δd pcf	M_c %	% SAT	REMARKS
SURFACE										
DARK GREY TOPSOIL										
LIGHT GREY AND GREY LEAN CLAY		1-AU	-	CL	-	-	-	15	-	
REDDISH BROWN AND GREY SANDY LEAN CLAY, LOVELAND LOESS	5	2-ST	-	CL	2.3	4.5+	90	24	78	3*
REDDISH BROWN AND TAN SANDY LEAN CLAY, LOVELAND LOESS		3-SS	15	CL	-	3.25	-	19	-	
YELLOW BROWN AND GREY SANDY LEAN TO FAT CLAY, TILL	10	4-ST	-	CL-CH	1.1	4.0	106	18	87	4*
LIGHT GREY BROWN AND GREY SANDY LEAN TO FAT CLAY, TILL	15	5-SS	24	CL-CH	-	4.5+	-	20	-	
END OF BORING AT 15.5'										
NO GROUNDWATER ENCOUNTERED										
* % DEFORMATION AT FAILURE	20									
	25									
	30									
	35									
	40									
	45									
	50									

Professional Service Industries, Inc.
RECORD OF SUBSURFACE EXPLORATION

Boring: 2

Project Name: PROPOSED NEW COVENANT CHURCH Date of Boring: FEBRUARY 1, 1996

Site: LINCOLN, NEBRASKA Project No: 172-65015

DESCRIPTION	DEPTH ft.	SAMPLE	N	CLASS	Q_u tsf	Q_p tsf	δd pcf	M_c %	% SAT	REMARKS
SURFACE										
6" TOPSOIL										
		1-CL	-	-	-	-	-	22	-	
GREY BROWN LEAN CLAY, LOVELAND LOESS		2-SS	21	CL	-	3.75	-	20	-	
	5									
		3-ST	-	CL	1.7	3.0	102	22	92	4*
	10	4-SS	18	CL	-	3.5	-	25	-	
LIGHT GREY BROWN AND GREY SANDY LEAN TO FAT CLAY, TILL	15	5-ST	-	CL-CH	1.0	4.5	104	21	95	4*
END OF BORING AT 15.5' NO GROUNDWATER ENCOUNTERED										
* % DEFORMATION AT FAILURE	20									
	25									
	30									
	35									
	40									
	45									
	50									

Professional Service Industries, Inc.
RECORD OF SUBSURFACE EXPLORATION

Boring: 3

Project Name: PROPOSED NEW COVENANT CHURCH Date of Boring: FEBRUARY 1, 1996

Site: LINCOLN, NEBRASKA Project No: 172-65015

DESCRIPTION	DEPTH ft.	SAMPLE	N	CLASS	Q_u tsf	Q_p tsf	δd pcf	M_c %	% SAT	REMARKS
SURFACE										
6" TOPSOIL										
BROWN LEAN CLAY TO SILT, ALT LOESS		1-AU	-	CL-ML	-	-	-	19	-	
GREY BROWN SANDY LEAN TO FAT CLAY, TILL	5	2-ST	-	CL-ML	-	4.5	113	13	77	
YELLOW BROWN SLIGHTLY SANDY LEAN TO FAT CLAY, TILL		3-SS	-	CL-CH	-	2.5	-	23	-	
	10	4-ST	-	CL-CH	1.5	1.5	107	18	87	15*
END OF BORING AT 10.5'										
NO GROUNDWATER ENCOUNTERED										
* % DEFORMATION AT FAILURE	15									
	20									
	25									
	30									
	35									
	40									
	45									
	50									

Professional Service Industries, Inc.
RECORD OF SUBSURFACE EXPLORATION

Boring: 4

Project Name: PROPOSED NEW COVENANT CHURCH Date of Boring: FEBRUARY 1, 1996

Site: LINCOLN, NEBRASKA Project No: 172-65015

DESCRIPTION	DEPTH ft.	SAMPLE	N	CLASS	Q_u tsf	Q_p tsf	δd pcf	M_c %	% SAT	REMARKS
SURFACE										
6" TOPSOIL										
DARK GREY BROWN LEAN CLAY, ALT LOESS		1-AU	-	CL	-	-	-	27	-	
GREY BROWN SANDY LEAN TO FAT CLAY, TILL	5	2-ST	-	CL-ML	4.9	4.25	109	19	95	4*
LIGHT GREY BROWN AND GREY SANDY LEAN TO FAT CLAY, TILL		3-SS	18	CL-CH	-	4.5+	-	18	-	
	10	4-ST	-	CL-CH	-	4.5	113	17	94	
END OF BORING AT 10.5'										
NO GROUNDWATER ENCOUNTERED										
* % DEFORMATION AT FAILURE	15									
	20									
	25									
	30									
	35									
	40									
	45									
	50									

Professional Service Industries, Inc.
RECORD OF SUBSURFACE EXPLORATION

Boring: 5

Project Name: PROPOSED NEW COVENANT CHURCH Date of Boring: FEBRUARY 1, 1996

Site: LINCOLN, NEBRASKA Project No: 172-65015

DESCRIPTION	DEPTH ft.	SAMPLE	N	CLASS	Q_u tsf	Q_p tsf	δd pcf	M_c %	% SAT	REMARKS
SURFACE										
DARK GREY BROWN LEAN CLAY, ALTERED LOESS		1-AU	-	CL	-	-	-	21	-	
GREY BROWN SANDY LEAN TO FAT CLAY, TILL	5	2-ST	-	CL-ML	2.7	3.0	106	17	80	4*
YELLOW BROWN SLIGHTLY SANDY LEAN TO FAT CLAY, TILL		3-SS	15	CL-CH	-	2.5	-	21	-	
LIGHT GREY BROWN AND GREY SANDY LEAN TO FAT CLAY, TILL	10	4-ST	-	CL-CH	1.9	2.75	105	21	98	15*
	15	5-SS	23	CL-CH	-	3.0	-	19	-	
END OF BORING AT 15.5' NO GROUNDWATER ENCOUNTERED										
* % DEFORMATION AT FAILURE	20									
	25									
	30									
	35									
	40									
	45									
	50									

Professional Service Industries, Inc.
RECORD OF SUBSURFACE EXPLORATION

Boring: 6

Project Name: PROPOSED NEW COVENANT CHURCH Date of Boring: FEBRUARY 1, 1996

Site: LINCOLN, NEBRASKA Project No: 172-65015

DESCRIPTION	DEPTH ft.	SAMPLE	N	CLASS	Q_u tsf	Q_p tsf	δd pcf	M_c %	% SAT	REMARKS
SURFACE										
DARK GREY BROWN LEAN CLAY, ALTERED LOESS		1-AU	-	CL	-	-	-	18	-	
YELLOW BROWN SLIGHTLY SANDY LEAN TO FAT CLAY, TILL	5	2-SS	18	CL-CH	-	4.5	-	15	-	
LIGHT GREY BROWN AND GREY SANDY LEAN TO FAT CLAY, TILL		3-ST	-	CL-CH	2.1	4.0	109	18	93	5*
	10	4-SS	28	CL-CH	-	4.5	-	21	-	
YELLOW BROWN CLAYEY SAND, GLACIAL	15	5-ST	-	SC	0.2	3.0	98	22	84	5* 0 Hour
YELLOW BROWN CLAYEY VERY FINE SAND, GLACIAL	20	6-SS	28	SC	-	-	-	27	-	
LIGHT GREY BROWN AND GREY SANDY LEAN TO FAT CLAY, TILL	25	7-SS	36	CL-CH	-	4.5	-	20	-	
	30	8-SS	29	CL-CH	-	4.5	-	19	-	
END OF BORING AT 30.5'										
* % DEFORMATION AT FAILURE	35									
	40									
	45									
	50									

Professional Service Industries, Inc.
RECORD OF SUBSURFACE EXPLORATION

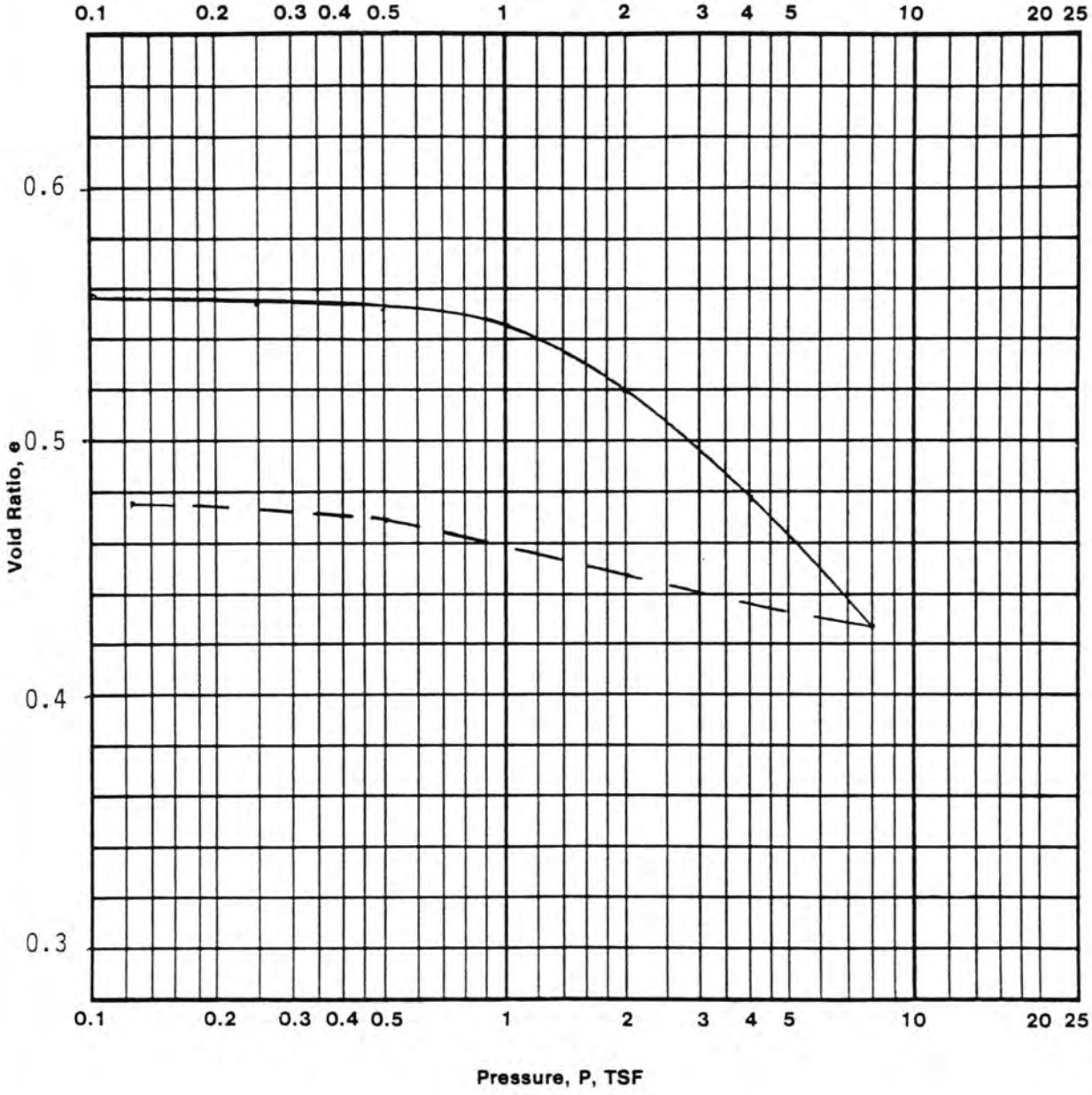
Boring: 7

Project Name: PROPOSED NEW COVENANT CHURCH — Date of Boring: FEBRUARY 1, 1996

Site: LINCOLN, NEBRASKA — Project No: 172-65015

DESCRIPTION	DEPTH ft.	SAMPLE	N	CLASS	Q_u tsf	Q_p tsf	δd pcf	M_c %	% SAT	REMARKS
SURFACE										
GREY BROWN SANDY LEAN TO FAT CLAY, TILL		1-AU	-	CL-ML	-	-	-	15	-	
		2-ST	-	CL-ML	-	4.5+	110	17	88	
	5									
LIGHT GREY BROWN AND GREY SANDY LEAN TO FAT CLAY, TILL		3-SS	18	CL-CH	-	4.5+	-	18	-	
	10	4-ST	-	CL-CH	2.5	4.5	111	18	94	5*
	15	5-SS	32	CL-CH	-	4.5	-	20	-	
	20	6-SS	-	CL-CH	-	4.5	-	17	-	
END OF BORING AT 20.5' NO GROUNDWATER ENCOUNTERED * % DEFORMATION AT FAILURE	25									
	30									
	35									
	40									
	45									
	50									

Professional Service Industries



Boring No.: 5
Sample No.: 4
Depth, ft.: 9' to 10½'
Type of Specimen: Undisturbed
Diameter, in.: 2.5
Height, in.: 1.0
Overburden Pressure, P_o, tsf: -
Preconsolidation Pressure, P_c, tsf: -
Compression Index, C_c: -

Liquid Limit: -
Plastic Limit: -
Specific Gravity: 2.65
Dry Density, pcf: 106.2
K_{20} at e_o: - x10⁻ cm/sec

		Before Test		After Test
Water Content, %:	w_o:	20.2	w_f:	20.6
Void Ratio:	e_o:	0.558	e_f:	0.476
Saturation, %:	s_o:	96.0	s_f:	

PROJECT NAME
Proposed New Covenant Church
Lincoln, Nebraska

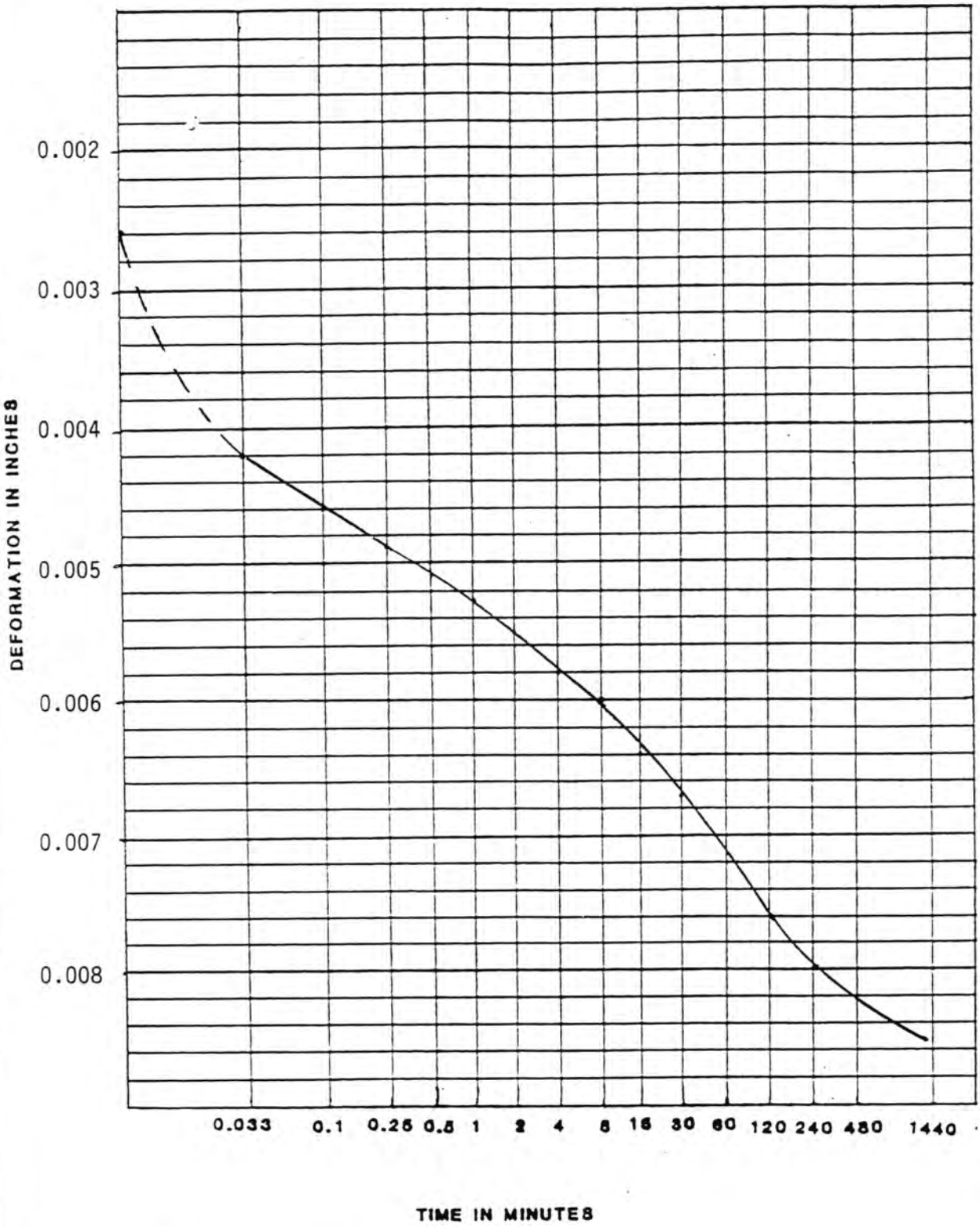
CONSOLIDATION TEST REPORT

PROJECT NO. 172-65015

DATE 2/29/96

PSI A-100-3

PROFESSIONAL SERVICE INDUSTRIES



CONSOLIDATION TEST TIME LOAD CURVES		BORING NO. 5	SAMPLE NO. 4
PROJECT NAME: New Covenant Church, Lincoln NE		PROJECT NO.: 172-65015	2/29/96

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classificaton System is used to identify the soil unless otherwise noted.

SOIL PROPERTY SYMBOLS

N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2 inch O.D. split-spoon.

Qu: Unconfined compressive strength, TSF.

Qp: Penetrometer value, unconfined compressive strength, TSF.

Mc: Water content, %.

LL: Liquid limit, %.

PI: Plasticity index, %.

δd: Natural dry density, PCF.

▼: Apparent groundwater level at time noted after completion of boring.

DRILLING AND SAMPLING SYMBOLS

SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.
ST: Shelby Tube - 3" O.D., except where noted.
AU: Auger Sample.
DB: Diamond Bit.
CB: Carbide Bit.
WS: Washed Sample.

RELATIVE DENSITY AND CONSISTENCY CLASSIFICATION

TERM (NON-COHESIVE SOILS)	STANDARD PENETRATION RESISTANCE
Very Loose	0-4
Loose	4-10
Medium	10-30
Dense	30-50
Very Dense	Over 50

TERM (COHESIVE SOILS)	Qu - (TSF)
Very Soft	0 - 0.25
Soft	0.25 - 0.50
Firm (Medium)	0.50 - 1.00
Stiff	1.00 - 2.00
Very Stiff	2.00 - 4.00
Hard	4.00+

PARTICLE SIZE

Boulders	8 in.+	Coarse Sand	5mm-0.6mm	Silt	0.074mm-0.005mm
Cobbles	8 in.-3 in.	Medium Sand	0.6mm-0.2mm	Clay	-0.005mm
Gravel	3 in.-5mm	Fine Sand	0.2mm-0.074mm		

Construction Notes

1. Earthwork - Strip all vegitation and topsoil from the area where embankments will be placed. Do not use debris, rock or frozen material for fill. Provide a Standard Proctor Density test of the material to be used for embankments , certified by an independent laboratory. Compact all fill areas to at least 95 % Standard Proctor Density at or up to 4% over optimum water content.

2. Topdressing - Use stockpiled topsoil to provide at least 4 inches of fertile soil for seeding.

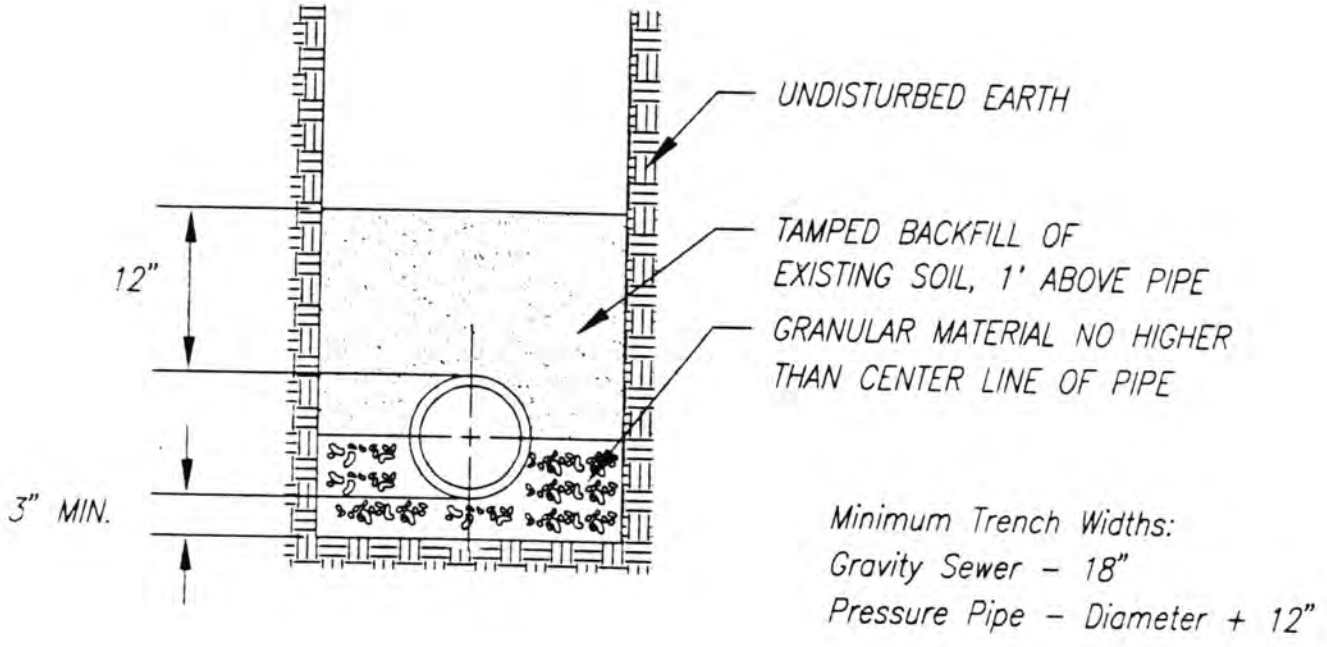
3. Fencing - Fence around the lagoon at a distance of six feet from the toe of the slope using either welded wire or woven wire fnecing four feet in height. Provide a gate at least twelve feet in width to facilitate mowing and maintenance.

4. Posting - Provide one sign on each side of the lagoon attached to the fence (see detail).

5. Seeding - Seed and mulch the disturbed areas using the same seed mixture as used for the rest of the grounds.

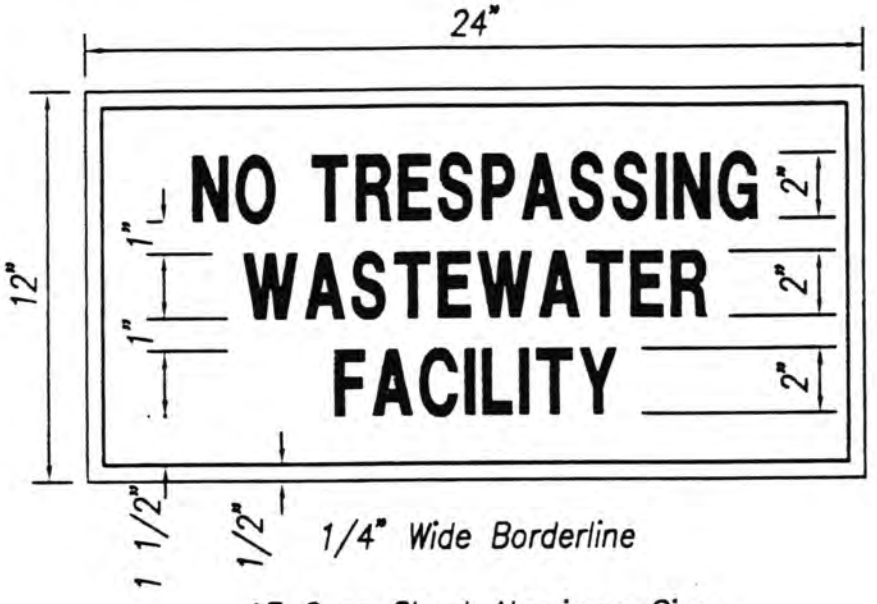
6. Drainage Ditch - Construct a drainage ditch along the west side of the lagoon to prevent surface water from the rest of the site entering the lagoon (see typical cross section A-A). The drainage ditch shall have a three foot wide bottom and 3 to 1 sideslopes. Construct the ditch with a one foot depth at the center of the west side of the lagoon and grade the ditch to drain at a one percent slope to the north and to the south.

7. Prefilling - After permiability testing and acceptance, prefill the lagoon to a depth of two feet with clear water prior to placing the facility into service.



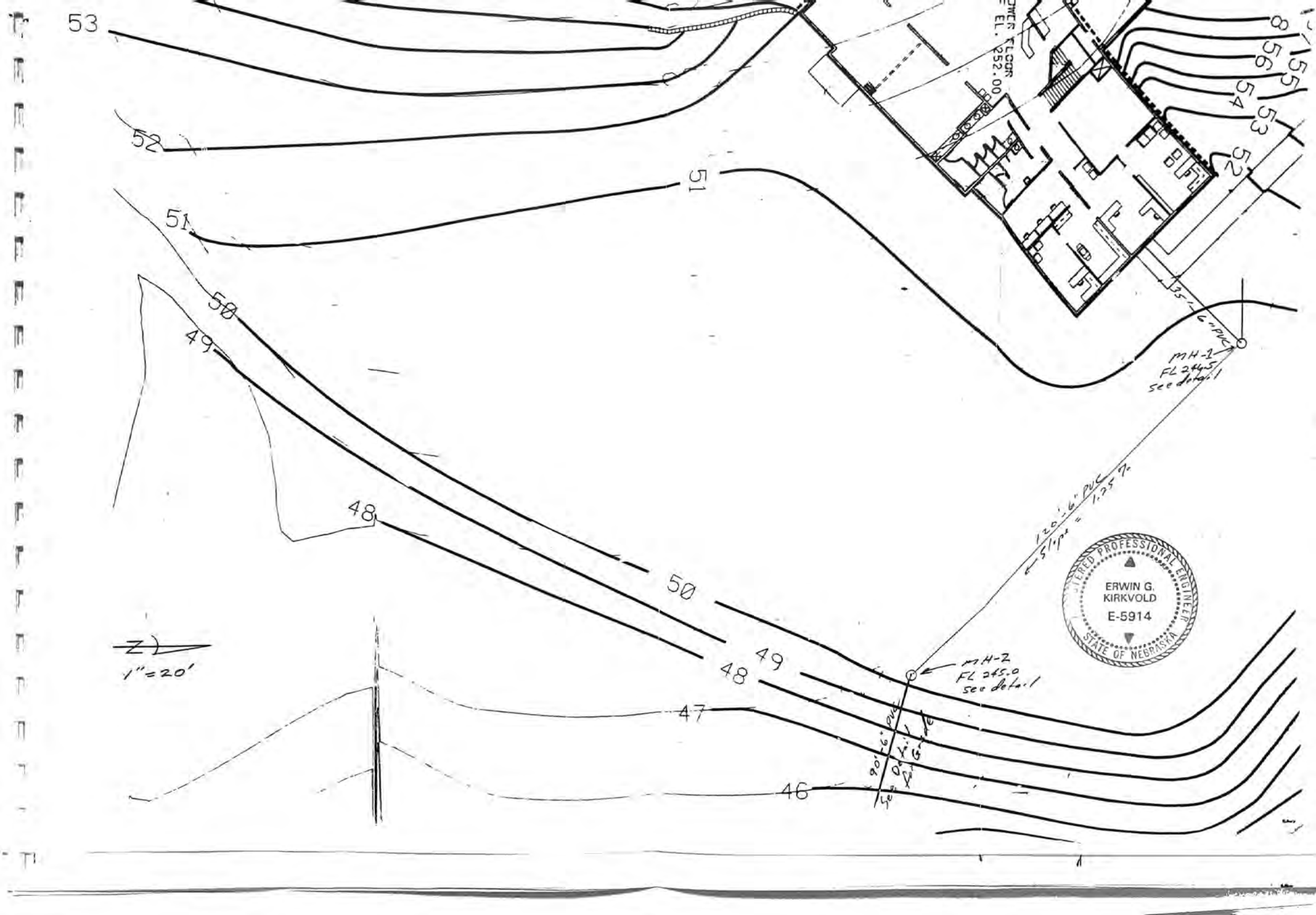
SEWER BEDDING

No Scale



WARNING SIGN (4 REQUIRED)

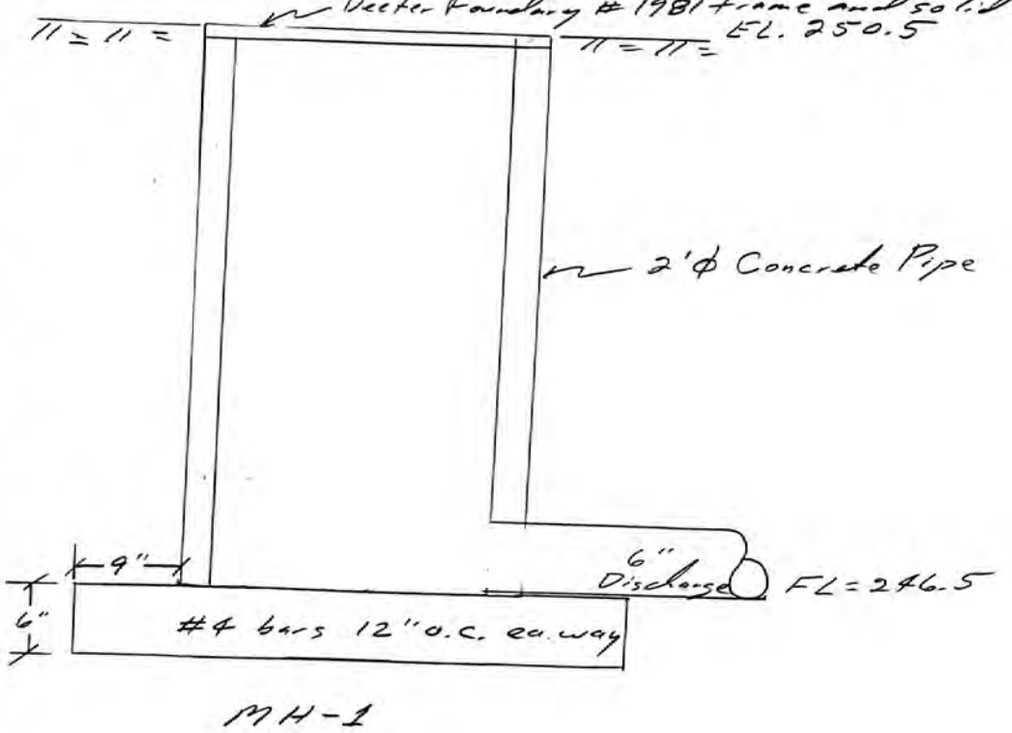
No Scale


53
52
51
51
50
49
48
50
49
48
47
46
55
55
54
53
52
MH-1
FL 244.5
see detail
120'-6" PVC
1.25 %
MH-2
FL 245.0
see detail
90'-6" PVC
ERWIN G.
KIRKVOLD
E-5914
REGISTERED PROFESSIONAL ENGINEER
STATE OF NEBRASKA
1"=20'

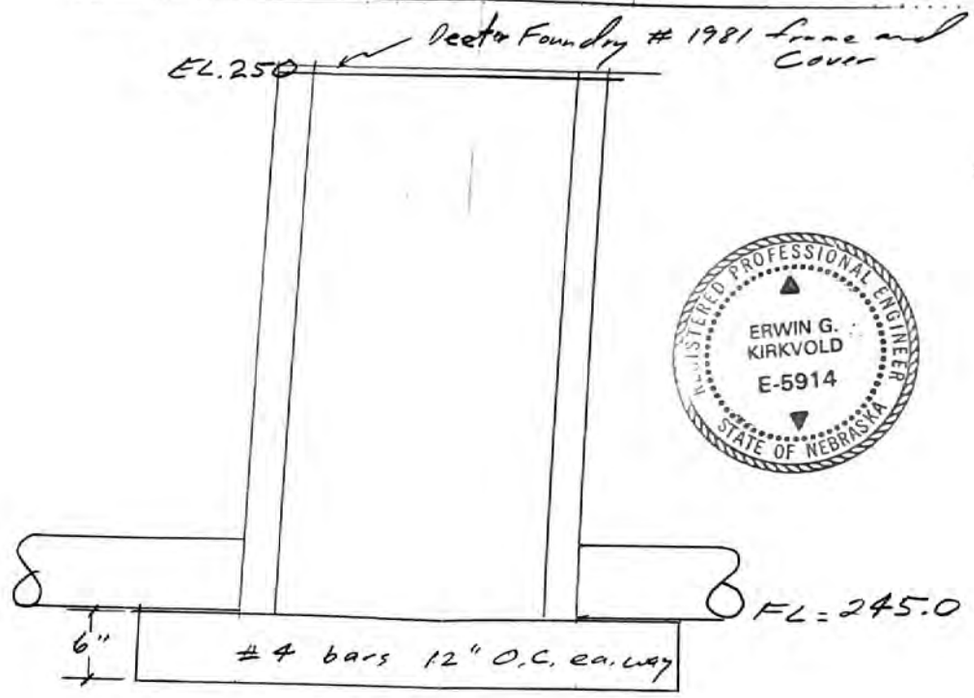
Lagoon Discharge Line Detail

Note: 1. From MH-2, 45° down to FL = 241.0
2. Maintain 4' cover under drainage ditch.
3. Anchor discharge pipe to 4'x4'x6" concrete pad for erosion protection. Reinforce pad with 6x6 wire mesh.



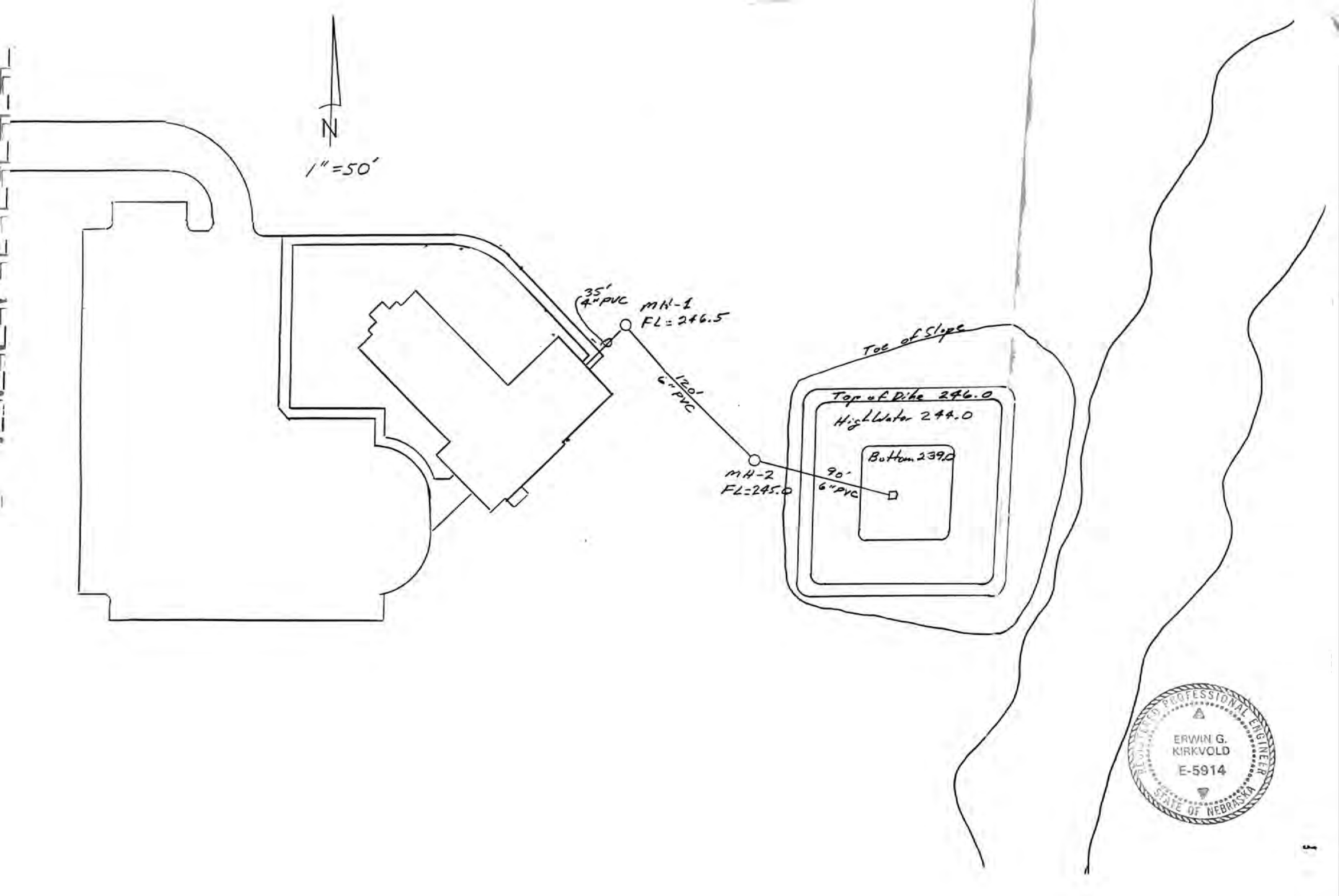


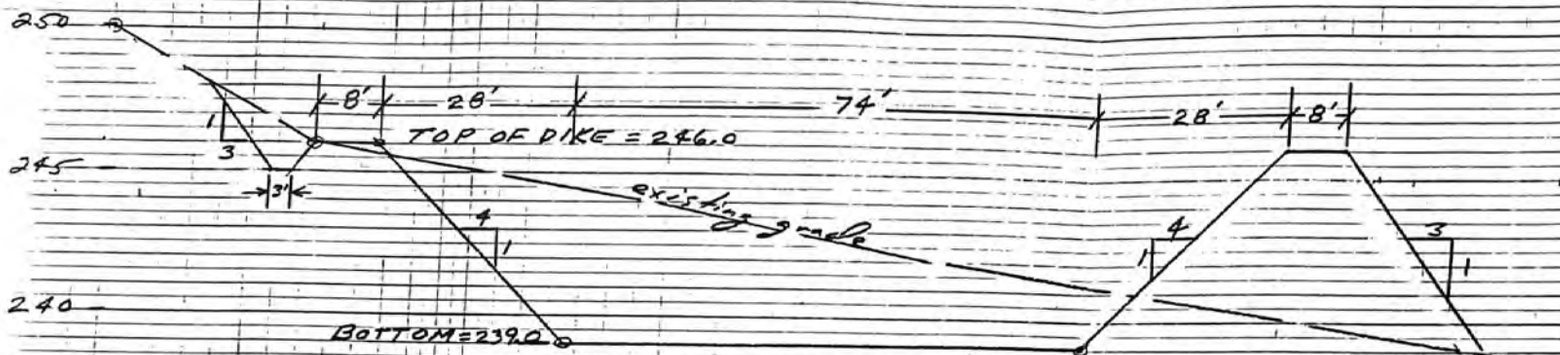
MH-1



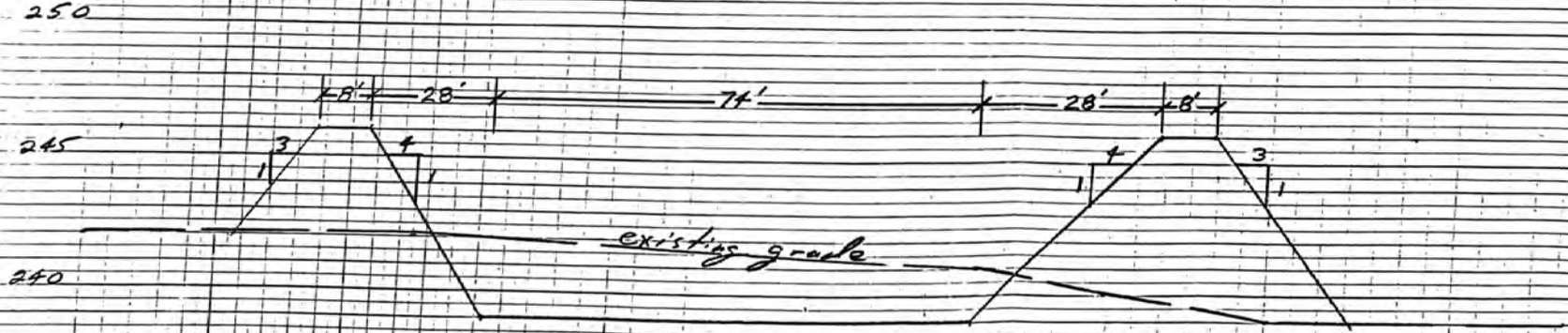
MH-2

REGISTERED PROFESSIONAL ENGINEER
ERWIN G. KIRKVOLD
E-5914
STATE OF NEBRASKA


N
1" = 50'
35'
4" PVC
MH-1
FL = 246.5
120'
6" PVC
MH-2
FL = 245.0
90'
6" PVC
Toe of Slope
Top of Dike 246.0
High Water 244.0
Bottom 239.0
REGISTERED PROFESSIONAL ENGINEER
ERWIN G.
KIRKVOLD
E-5914
STATE OF NEBRASKA

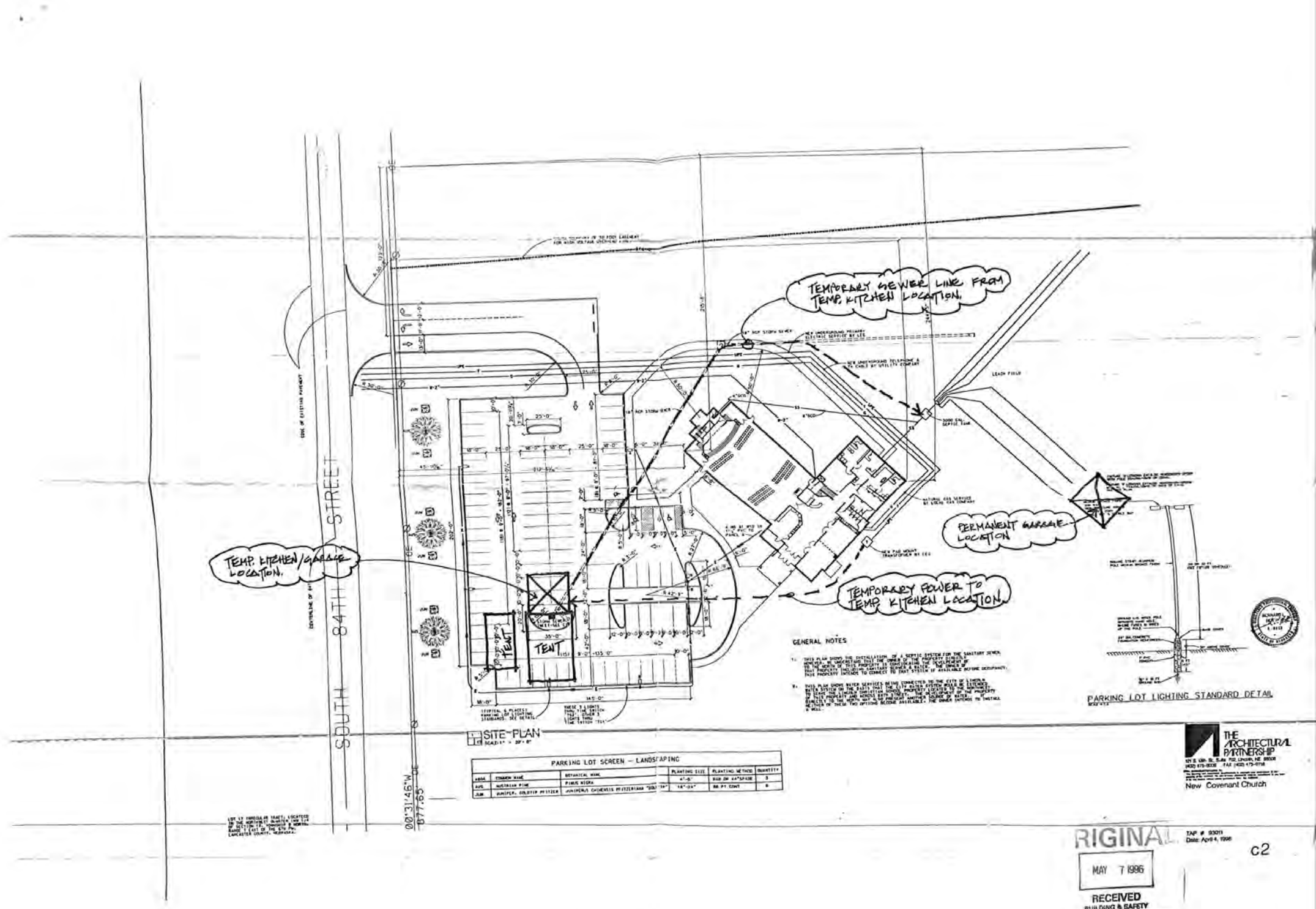


SECTION A-A



SECTION B-B

REGISTERED PROFESSIONAL ENGINEER
ERWIN G. KIRKVOLD
E-5914
STATE OF NEBRASKA


TEMPORARY SEWER LINE FROM TEMP. KITCHEN LOCATION.
TEMP. KITCHEN/GARAGE LOCATION.
PERMANENT GARAGE LOCATION
TEMPORARY POWER TO TEMP. KITCHEN LOCATION.
SOUTH 84TH STREET
TENT
TENT
SITE PLAN
PARKING LOT LIGHTING STANDARD DETAIL
GENERAL NOTES
PARKING LOT SCREEN — LANDSCAPING
THE ARCHITECTURAL PARTNERSHIP
New Covenant Church
ORIGINAL
MAY 7 1996
RECEIVED
BUILDING & SAFETY
TAP # 93011
Date: April 4, 1996
c2