Lincoln-Lancaster County Health Department
Environmental Public Health Division
3140 N Street • Lincoln NE 68510-1514
Phone: 402-441-8643

A

Permit Number

Onsite Wastewater Treatment System Permit Application

Include Form B and C. Submit correct fee with this Application

☒ Septic System ☐ Lagoon ☐ Other (Refer to Form C)

PLEASE PRINT OR TYPE

A. Onsite System Location

Address* 27077 SW 42nd St. (no rural route) City Hallam, NE Zip 68368

Legal Description: SE (1/4) 1/4 | 30 Section | 7N Township | 6E Range | 6th Principal Meridian Subdivison | 20 Lot

PID 0730200003000 *Approx. Address (If to be determined)

B. Owner

Name Monolith Materials Signature

Address 134 S. 13th St, Suite 700 City/State/Zip Lincoln, NE 68508

Home Phone Work Phone 402 413-5763

C. Certified Installer

Name: Dustin J Barrett Signature Dustin Barrett

Address 151 S. 66th Rd City/State/Zip Nebraska City, NE 68410

Work Phone 402 873-3292

D. Engineer

☒ Check and complete if engineer designed system P.E. License Number: F-7854

Designer Name Frank Doland Firm Alfred Benesch & Company Work Phone 402 479-2200

E. This system will serve a

☐ Residential Dwelling Number of Bedrooms ____ Whirlpool Bathtub? ☐ Yes ☐ No Total Acres ____

Garbage Grinder? ☐ Yes ☐ No

☒ Commercial Establishment/Other Facility Specify Carbon Black Production Design flow in gallons per day 1,684

Type of Wastewater ☒ Domestic ☐ Non-Domestic

DO NOT WRITE BELOW THIS LINE

Approval Process

1. Health Department
Site visits ____
Comments ____
Date rec'd ____ Date frwd ____
ACTION ☐ Approved ☐ Disapproved Signature ____

2. Supt. Bldg. Insp. or Village Clerk
Comments ____
Date rec'd ____ Date frwd ____
ACTION ☐ Approved ☐ Disapproved Signature ____

3. City or County Engineer
Comments ____
Date rec'd ____ Date frwd ____
ACTION ☐ Approved ☐ Disapproved Signature ____

Installation Final Written Approval
By ____
Date ____

Business Office Use Only
Date Received 10-07-19 Amount Paid $430.00
Received By JMO Cash/Check No 30267

White - Health Department Yellow - Engineer Pink - Building & Safety

Nate C. Hartman

From: Barrett <barrettcompany@aim.com>
Sent: Monday, October 07, 2019 11:38 AM
To: Nate C. Hartman
Subject: Re: Monolith Septic system
Attachments: Monolith-Lancaster permit application.pdf

Nate
Here is the application permit application, minus owner signature.
Please let me know if there is anything else you need.
Thanks
Lorie

Barrett Construction Co.
151 S. 66th Rd
Nebraska City, NE 68410
402 873-3292

-----Original Message-----
From: Nate C. Hartman <nhartman@lincoln.ne.gov>
To: Barrett <barrettcompany@aim.com>
Sent: Mon, Oct 7, 2019 10:14 am
Subject: RE: Monolith Septic system

Lorie:

I am not sure why "Monolith" is telling you this. We have additional permitting REQUIREMENTS in Lancaster County. If they have any questions, please tell them to reference the State issued Construction Permit. The entire 7th paragraph of the Construction Permit itself should clarify…

I will review what you have submitted and get back with you this afternoon, unless I can get to it sooner…

Nate Hartman REHS, QCIS, QPSWPPP
Senior Environmental Health Specialist
3131 'O' Street, Lincoln, NE 68510
O: 402-441-8643 F: 402-441-3890

From: Barrett [mailto:barrettcompany@aim.com]
Sent: Monday, October 07, 2019 10:08 AM
To: Nate C. Hartman <nhartman@lincoln.ne.gov>
Subject: Re: Monolith Septic system

Nate
Here is what I have at this time. It sounds like Monolith and their consulting and engineering groups are saying that the local (county) does not need to be involved. But from our experience they do. So let me know what else you need or if you have any questions. I have several more pages of the plans, but these show location and layout.
Thanks
Lorie

Barrett Construction Co.
151 S. 66th Rd
Nebraska City, NE 68410
402 873-3292

-----Original Message-----
From: Nate C. Hartman <nhartman@lincoln.ne.gov>
To: Barrett <barrettcompany@aim.com>
Sent: Mon, Oct 7, 2019 8:42 am
Subject: RE: Monolith Septic system

Send me what you have compiled. Also, the use of distribution boxes is NOT a requirement of Title 124. In the event that your ground slope is greater than 3%, you would then be required to use drop boxes. That said, this is an engineer designed system. It falls outside the "authorization by rule" of Title 124,-meaning, those rule don't apply. This is a site specific permit approved by the state.

I will help you cut through the red tape as much as possible. In the meantime, send me what you have. Keep in mind that only an engineer, or certified professional can conduct viable perc tests in Nebraska. If this can't be substantiated, it will need to be redone.

Hope this helps…

Thanks!

Nate Hartman REHS, QCIS, QPSWPPP
Senior Environmental Health Specialist
3131 'O' Street, Lincoln, NE 68510
O: 402-441-8643 F: 402-441-3890

From: Barrett [mailto:barrettcompany@aim.com]
Sent: Thursday, October 03, 2019 4:18 PM
To: Nate C. Hartman <nhartman@lincoln.ne.gov>
Subject: Monolith Septic system

Nate
I am trying to pull everything together to get to you for the Onsite Wastewater treatment system permit application. I have a copy of the Perk test from 2016, but no name on it. I have a copy of the design plans. I have a copy of the Construction Permit from DEQ. Is there anything else, but the completed application that you would need?
The other question I have is the engineered design shows 4" crosses and not using distribution boxes, is this allowed in Lancaster County?
Thanks
Lorie

Barrett Construction Co.
151 S. 66th Rd
Nebraska City, NE 68410
402 873-3292
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Nate C. Hartman

From: Doland, Frank <FDoland@benesch.com>
Sent: Monday, October 07, 2019 11:38 AM
To: Nate C. Hartman
Cc: Matthew Rhodes; Alonzo Casas (alonzo.casas@monolithmaterials.com)
Subject: RE: Septic System Install in Hallam, NE

Importance: High

Matt: Thanks for getting back to me

Can I come in your office this afternoon and fill out the application?

Frank Doland, PE | Senior Project Manager
Alfred Benesch & Company | 825 M Street, Suite 100 Lincoln, NE 68508
P 402-479-2200 / *Direct:* 402-479-2412 | F 402-479-2276 | C 402-560-3985 | E fdoland@benesch.com | W www.benesch.com

From: Nate C. Hartman <nhartman@lincoln.ne.gov>
Sent: Monday, October 07, 2019 11:20 AM
To: Doland, Frank <FDoland@benesch.com>
Subject: RE: Septic System Install in Hallam, NE

Frank:

State permitting is step one of this process. In addition, there is also local permitting that, at this point, has not been accounted for. To date, I have not received a permit application for this project. I will review the information that has been provided but, regardless, this project will still have to be permitted locally. I believe the onsite wastewater contractor that bid the job came into our office last week to get registered in Lancaster County, but, to my knowledge, no permit application was left.

I will be in the office this afternoon. I would like to streamline this project as well. Please keep in mind that I haven't even started reviewing the information provided so everything I am telling you at this point is based off of hear-say. I will review this paperwork/email chain in-depth first thing this afternoon...

Thanks!

Nate Hartman REHS, QCIS, QPSWPPP
Senior Environmental Health Specialist
3131 'O' Street, Lincoln, NE 68510
O: 402-441-8643 F: 402-441-3890

From: Doland, Frank [mailto:FDoland@benesch.com]
Sent: Monday, October 07, 2019 10:51 AM

To: Nate C. Hartman <nhartman@lincoln.ne.gov>
Subject: FW: Septic System Install in Hallam, NE
Importance: High

Nate: Please see below. I accidently typed your email wrong the first time

Frank Doland, PE | Senior Project Manager
Alfred Benesch & Company | 825 M Street, Suite 100 Lincoln, NE 68508
P 402-479-2200 / *Direct:* 402-479-2412 | F 402-479-2276 | C 402-560-3985 | E fdoland@benesch.com | W www.benesch.com

From: Doland, Frank
Sent: Monday, October 07, 2019 10:44 AM
To: nhatrman@lincoln.ne.gov
Cc: Matthew Rhodes <matthew.rhodes@monolithmaterials.com>; Alonzo Casas (alonzo.casas@monolithmaterials.com) <alonzo.casas@monolithmaterials.com>
Subject: Septic System Install in Hallam, NE
Importance: High

Nate: We designed a septic system for the Monolith Project in Hallam, NE.

The plans and specs were reviewed and approved through the Nebraska Department of Environmental Quality (NDEQ). Attached is the Underground Injection Control Class V Authorization Letter.

Also attached is a copy of the design plans. A stamped as Approved copy of the plans is at the project construction office.

I thought that would be all of the permitting required, however I have been told that you have an interest in this.

Please advise what more we need than an NDEQ approval. We are trying to construct this now so please advise ASAP. The easiest way to reach me besides email in on my cell phone at 402-560-3985.

Thanks!!

Frank Doland, PE | Senior Project Manager
Alfred Benesch & Company | 825 M Street, Suite 100 Lincoln, NE 68508
P 402-479-2200 / *Direct:* 402-479-2412 | F 402-479-2276 | C 402-560-3985 | E fdoland@benesch.com | W www.benesch.com

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NEBRASKA

Good Life. Great Environment.

DEPT. OF ENVIRONMENTAL QUALITY

JUN 2 8 2019

Pete Ricketts, Governor

Monolith Materials
ATTN: Phillip Joyner
134 S. 13th St.
Suite 700
Lincoln, NE 68508

RE: Monolith Materials
NDEQ ID: 106638
Program ID: UIC NE0212236
Subject: Underground Injection Control Class V Authorization

To Whom It May Concern:

The Nebraska Department of Environmental Quality (NDEQ) has reviewed your applications for Class V injection wells (large capacity septic system) to dispose of domestic wastewater at the above referenced sites, received May 11, 2019. The Department has approved the applications you submitted, and you are hereby authorized to dispose of domestic wastewater per Title 122 – Rules and Regulations for Underground Injection and Mineral Production Wells. A construction permit may need to be obtained through the NDEQ On-Site Wastewater Treatment Program (Title 124 – Rules and Regulations for the Design, Operation and Maintenance of On-Site Wastewater Treatment Systems) and/or your local building inspector before any upgrades or changes are made to the system. The Title 124 requirements are separate from and in addition to the Title 122 requirements. If any other wastes will be disposed of utilizing these septic systems, other than the domestic waste indicated above, a separate UIC permit would need to be obtained. Enclosed is your authorization.

If you have any questions concerning this authorization, please feel free to contact me at (402) 471-4290 or via email at amanda.c.jones@nebraska.gov.

Sincerely,

Amanda Jones
UIC Coordinator
Ground Water Unit
Water Quality Division

Enclosure
cc: Tricia Scott, NDEQ

Department of Environmental Quality
P.O. Box 98922
1200 N Street, Suite 400
Lincoln, Nebraska 68509-8922

deq.ne.gov

Jim Macy, Director
OFFICE 402-471-2186 FAX 402-471-2909
ndeq.moreinfo@nebraska.gov

DEPARTMENT OF ENVIRONMENTAL QUALITY
AUTHORIZATION FOR
CLASS V WELL UNDERGROUND INJECTION

Authorization Number NE0212236

In compliance with the Nebraska Environmental Protection Act, Neb. Rev. Stat. Secs. 81-1501, 81-1502, 81-1504 through 81-1510 and 81-1527 (Reissue, 1994) and the Nebraska Administrative Procedure Act, Neb. Rev. Stat. Secs. 84-901 through 84-903, 84-905 through 84-919 and the Rules and Regulations and Standards adopted pursuant thereto,

Monolith Materials
Hallam, Nebraska

is authorized to conduct underground injection of domestic wastewater using a Class V Injection Well (5W32 large capacity septic system) located in the of Section 30, Township 7 North, Range 6 East, Lancaster County, Nebraska.

This activity will be conducted in accordance with all rules and regulations pursuant to Title 122 – Rules and Regulations for Underground Injection and Mineral Production Wells and the attached limitations and monitoring requirements.

ISSUED: JUN 2 8, **2019** **EXPIRES:** JUN 2 7 , **2029**

Pursuant to a Delegation Memorandum dated August 22, 2016 and signed by the Director, the undersigned hereby executes this document on the behalf of the Director.

Signed this 28th day of June, 2019

Marty Link
Water Quality Division Administrator

CHECK # 1016
RECEIVED $450

79768- - - -

Nebraska DEQ

Onsite Wastewater Treatment System
Application for Construction/Operating Permit

RECEIVED
MAR 18 2019
Nebraska Dept of Environmental Quality
By: DEQ#195

For NDEQ Use Only	NDEQ ID:	Program ID:

Print or Type

PHILLIP | E | JOYNER
Owner/Authorized Representative First Name | Initial | Last Name

MONOLITH NEBRASKA, LLC
Business or Legal Entity Name (if applicable)

27077 SW 42ND STREET | HALLAM | NE | 68368
Owner Address | City | State | Zip

Phone Number 402-413-5763 Email PHIL.JOYNER@MONOLITHMATERIALS.COM

☒ Check here if authorized representative and include a description of the representative's authority to sign on behalf of the owner. VICE PRESIDENT OF MANUFACTURING

Professional Engineer, Master Installer or Registered Environmental Health Specialist

Print or Type

Frank | J. | Doland | E-7854
First Name | Initial | Last Name | Certification/License Number

Alfred Benesch & Company
Company Name

825 M Street | Lincoln | NE | 68508
Mailing Address | City | State | Zip

Phone Number 402-479-2412 Email fdoland@benesch.com

Location *Legal description* OR *Geographical coordinates to 4 decimal points*

¼	¼	Section	Township	Range	County	/	Latitude	Longitude
	SE	30	7N	6E	Lancaster		40.5472Deg N	96.7819Deg W

Physical address if different than owner's mailing address

System Information

☐ Dwelling-Peak single day flow _____ gals **OR** ☒ Non-dwelling-Peak single day flow 1,648 gals

☒ Domestic Wastewater ☐ Non-Domestic Wastewater -Description of non-domestic wastewater sources (i.e. restaurant, laundry, butcher shop, camper dump station or other)_____

☒ New System ☐ Modification, reconstruction or alteration of existing system

☒ Septic System ☐ Mound ☐ Holding tank ☐ Lagoon ☐ Other (if other, describe here)_____

Depth to seasonal high groundwater for planned location of the soil absorption system 20 ft.

Percolation rate 32.5 min/inch Maximum ground slope 2 %

I swear or affirm that the application information and documentation submitted are true, complete and accurate

F B Doland
Owner/Authorized Representative Signature

3/18/2019
Date

NOTICE: Failure to complete the form or include the appropriate fee(s) will delay the application. NDEQ issued construction permit is required prior to any construction.

Version 5-1

20190026102

Onsite Wastewater Treatment System Application for Construction/Operating Permit

Nebraska DEQ

For NDEQ Use Only	NDEQ ID:	Program ID:

Print or Type

PHILLIP | E | JOYNER
Owner/Authorized Representative First Name | Initial | Last Name

MONOLITH NEBRASKA, LLC
Business or Legal Entity Name (if applicable)

27077 SW 42ND STREET | HALLAM | NE | 68368
Owner Address | City | State | Zip

Phone Number 402-413-5763 Email PHIL.JOYNER@MONOLITHMATERIALS.COM

☒ Check here if authorized representative and include a description of the representative's authority to sign on behalf of the owner. VICE PRESIDENT OF MANUFACTURING

Professional Engineer, Master Installer or Registered Environmental Health Specialist

Print or Type

Frank | J. | Doland | E-7854
First Name | Initial | Last Name | Certification/License Number

Alfred Benesch & Company
Company Name

825 M Street | Lincoln | NE | 68508
Mailing Address | City | State | Zip

Phone Number 402-479-2412 Email fdoland@benesch.com

Location *Legal description* OR *Geographical coordinates to 4 decimal points*

¼	¼	Section	Township	Range	County	/	Latitude	Longitude
	SE	30	7N	6E	Lancaster		40.5472Deg N	96.7819Deg W

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System Information

☐ Dwelling-Peak single day flow _____ gals **OR** ☒ Non-dwelling-Peak single day flow 1,648 gals

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☒ Septic System ☐ Mound ☐ Holding tank ☐ Lagoon ☐ Other (if other, describe here)_____

Depth to seasonal high groundwater for planned location of the soil absorption system 20 ft.

Percolation rate 32.5 min/inch Maximum ground slope 2 %

I swear or affirm that the application information and documentation submitted are true, complete and accurate.

_____ _____
Owner/Authorized Representative Signature Date

NOTICE: Failure to complete the form or include the appropriate fee(s) will delay the application. NDEQ issued construction permit is required prior to any construction.

Version 5-2012

benesch

Alfred Benesch & Company
825 M Street, Suite 100
Lincoln, NE 68508
www.benesch.com
P 402-479-2200
F 402-479-2276

March 18, 2019

CHECK RECEIVED #1614 $450

RECEIVED

MAR 18 2019

Nebraska Dept of Environmental Quality
By: _____

Tom Buell
Nebraska Department of Environmental Quality
1200 N Street, Suite 400
P.O. Box 98922
Lincoln, NE 68509-8922

RE: **Monolith Domestic Waste Water**

Dear Mr. Buell:

Attached are plans and specification for a wastewater system for the new Monolith plant that is being constructed in Hallam, NE.

The plant will gravity drain waste from the plant to a lift station that our Benesch plans are providing. This plan set includes the lift station then from the lift station we pump it un to a location where we will construct 2 Septic tanks in series. From the septic tanks the wastewater will then gravity flow to a leach field. Calculations for leach field and septic tank sizing are shown on plan sheet 2.

We are attaching one full size plan set and two half size plan sets as well as 3 copies of leach field perk tests results and sanitary sewer specifications.

We look forward to your review and approval. Questions and\or comments can be directed to me at 402-479-2412 or fdoland@benesch.com.

Sincerely:

Alfred Benesch & Company

Frank Doland, P.E.
Sr. Project Manager

Monolith Materials

Olive Creek Plant – Hallam, NE

Perk Test Results and Sanitary sewer Specification

March, 2019



In-Field Percolation Test

Project: Monolith
Hallam, NE

Date: 6/9/2016 Soil Type: Lean Clay (Peoria Loess)

Location	Hole Depth (in.)	Beginning Reading			End Reading		Results			Last Reading
		Date	Time (min.)	Depth to Water (in.)	Time (min.)	Depth to Water (in.)	Elapsed Time (min.)	Drop in Water Level	Percolation Rate (min./ in.)	
1	60	6/9/2016	0	53.0	30	54.2	30	1.2	25.0	
1	60	6/9/2016	0	54.2	30	55.5	30	1.3	23.1	**25.0**
1	60	6/9/2016	0	52.5	30	53.7	30	1.2	25.0	
1	60	6/9/2016	0	53.7	30	54.9	30	1.2	25.0	
2	60	6/9/2016	0	53.1	30	54.0	30	0.9	33.3	
2	60	6/9/2016	0	54.0	30	54.9	30	0.9	33.3	**37.5**
2	60	6/9/2016	0	53.5	30	54.4	30	0.9	33.3	
2	60	6/9/2016	0	54.4	30	55.2	30	0.8	37.5	
3	60	6/9/2016	0	53.0	30	53.8	30	0.8	37.5	
3	60	6/9/2016	0	53.8	30	54.6	30	0.8	37.5	**42.9**
3	60	6/9/2016	0	53.2	30	54.0	30	0.8	37.5	
3	60	6/9/2016	0	54.0	30	54.7	30	0.7	42.9	
4	60	6/9/2016	0	53.5	30	54.5	30	1.0	30.0	
4	60	6/9/2016	0	54.5	30	55.5	30	1.0	30.0	**27.3**
4	60	6/9/2016	0	53.2	30	54.3	30	1.1	27.3	
4	60	6/9/2016	0	54.3	30	55.4	30	1.1	27.3	
5	60	6/9/2016	0	53.2	30	54.1	30	0.9	33.3	
5	60	6/9/2016	0	54.1	30	55.0	30	0.9	33.3	**37.5**
5	60	6/9/2016	0	53.0	30	53.8	30	0.8	37.5	
5	60	6/9/2016	0	53.8	30	54.6	30	0.8	37.5	
6	60	6/9/2016	0	52.5	30	53.7	30	1.2	25.0	
6	60	6/9/2016	0	53.7	30	54.9	30	1.2	25.0	**25.0**
6	60	6/9/2016	0	53.0	30	54.2	30	1.2	25.0	
6	60	6/9/2016	0	54.2	30	55.4	30	1.2	25.0	

Average of Percolation Tests (sum of rates/number of tests) or (slowest rate measured) if more than 20 min/in difference: **32.5**

SECTION 22 13 13

FACILITY SANITARY SEWERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Pipe and fittings.
2. Nonpressure couplings.
3. Cleanouts.
4. Encasement for piping.
5. Manholes and Appurtenances

1.3 CLOSEOUT SUBMITTALS

A. Field Quality-Control Reports: For inclusion in separate test reports section of Operation and Maintenance Manual.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Do not store plastic pipe, and fittings in direct sunlight.

B. Protect pipe, pipe fittings, and seals from dirt and damage.

1.5 PROJECT CONDITIONS

A. Interruption of Existing Sanitary Sewerage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:

1. Notify Owner no fewer than five days in advance of proposed interruption of service.
2. Do not proceed with interruption of service without Owner's written permission.

PART 2 - PRODUCTS

2.1 PVC PIPE AND FITTINGS

A. Pipe and Fittings:

1. Pipe: PVC pipe and fittings for 15 inch and smaller sizes shall meet the requirements of "Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings" ASTM D-3034, Type PSM, SDR 26 minimum. PVC pipe and fittings for 18 inch through 27 inch sizes shall meet the requirements of "Standard Specification for Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings" ASTM F-679. PVC pipe and fittings manufactured under "Standard Specification for Type PS-46 and Type PS-115 Poly (Vinyl Chloride) (PVC) Plastic Gravity Flow Sewer Pipe and Fittings" ASTM F-789, Type PS-46 or "Standard Specification for Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings" ASTM F-679 with T-2 wall thickness shall not be acceptable. All pipe shall be furnished in standard laying lengths. Shorter field cut lengths for curvilinear alignment may be used, provided that spigot ends are carefully cut to a perpendicular cross section and the ends beveled to permit proper jointing.

2. Joints for Pipe and Fittings: Joints for PVC non-pressure pipe and fittings shall meet the requirements of Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals" ASTM D-3212 for integral bell, single synthetic rubber gasket push-on joints. Joints using separate couplings or couplings solvent welded to one end of the pipe shall not be acceptable. Lubricants, if required, shall have no deteriorating effects on the gasket and pipe materials.

3. Manhole Water Stops: Water stops shall be required for all connections of PVC pipe with manholes. Water stops shall be of a type approved by the Project Manager, consisting of specifically manufactured synthetic elastomeric rings or boots stretched around the pipe and clamped, if applicable, with stainless steel clamps.

2.2 DUCTILE-IRON FITTINGS

A. Fittings: ANSI/AWWA C110/A21.10 and shall be supplied with a standard weight cement mortar lining conforming to ANSI/AWWA C104/A21.4 and all necessary glands, bolts, nuts and gaskets to complete a non-restrained mechanical joint fitting connection. Ductile iron compact fittings shall be in accordance with ANSI/AWWA C153/A.21.53. All joints shall be mechanical joint bells unless otherwise provided in the Contract Documents.

Pressure ratings for fittings shall be a minimum of 250 p.s.i. water working pressure for 12 inch nominal diameter and smaller, based on the diameter of the largest bell. For fittings larger than 12 inch nominal diameter, a pressure rating of 150 p.s.i. shall be used unless otherwise specified.

2.3 MANHOLE AND APPURTAENANCES

A. Iron Castings

1. Manhole covers and frames shall be iron castings which shall meet the requirements of "Specification for Gray Iron Castings", ASTM Designation A-48, Class 30. All frames and covers shall be furnished with horizontal bearing surfaces machined and fitted so as to prevent any rocking in the frame when installed. No casting will be accepted that is warped, cracked, that has swells, or that has been plugged or filled.

B. Mortar

1. Mortar used in the construction of manholes or other appurtenant structures shall be Type S as specified in "Standard Specification for Mortar for Masonry" ASTM Designation C-270. Proportions of the mixture shall conform to either of the two following alternates:

Alternate	Portland Cement	Masonry Cement	Hydrated Lime or lime Putty	Aggregate Loose & Damp
1	½	1	0	Not less than 2-1/4 nor more than 3 times the Sum of the volume of The cements and lime Used.
2	1	0	¼- ½	

C. Precast Manhole Sections, Risers, and Adjusting Rings

1. Precast concrete manhole sections and risers shall conform to the requirements of "Standard Specification for Precast Reinforced Concrete Manhole Sections" ASTM Designation C-478. Precast manhole base sections shall be manufactured using rubber gasket seals meeting the requirements of "Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals" ASTM Designation C-923. When adjusting manhole rim elevations less than 4 inches, the Contractor shall use brick masonry construction. When adjusting rim elevations more than 4 inches, the Contractor shall use precast concrete adjusting rings to bring the manhole cover and frame to proper grade. Precast concrete adjusting rings shall conform to "Standard Specification for Precast Reinforced Concrete Manhole Sections" ASTM Designation C-478.

D. Manhole Joints

1. Joints between precast manhole sections, risers, and adjusting rings shall be made using either mastic type gaskets or synthetic elastomer type gaskets. Mortar joints shall not be acceptable for manhole sections and risers. Mortar joints shall only be used in conjunction with adjusting rings and brick masonry Work in bringing manhole covers and frames to proper grade.

2. Mastic type gasket joints shall be K.T. Snyder "Ram-Nek", Hamilton-Kent "Kent Seal No. 2", Sheller-Globe "Tac-Tite", or equal. The size of mastic type gaskets shall be as recommended by the manhole manufacturer.

2.4 SEWER SERVICE PIPE AND FITTINGS

A. Pipe: PVC pipe and fittings for 6 inch and smaller sizes shall be Schedule 40 PVC minimum. PVC pipe and fittings shall meet the requirements of ASTM D2680-01(2014) "Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Composite Sewer Piping" All pipe shall be furnished in standard laying lengths. Shorter field cut lengths for curvilinear alignment may be used, provided that spigot ends are carefully cut to a perpendicular cross section and the ends beveled to permit proper jointing.

2.5 CONCRETE

A. General: Cast-in-place concrete complying with ACI 318, and the following:

1. Cement: ASTM C 150, Type II.
2. Fine Aggregate: ASTM C 33, sand.
3. Coarse Aggregate: ASTM C 33, crushed gravel.
4. Water: Potable.

B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio.

1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.

C. Manhole Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio. Include channels and benches in manholes.

1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.

2. Invert Slope: 1 percent through manhole.

3. Benches: Concrete, sloped to drain into channel.

   a. Slope: 4 percent.

D. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water/cementitious materials ratio.

1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Section 31 23 00 "Excavation & Embankment."

3.2 PIPING INSTALLATION

A. Hauling, Delivery and Storage of Pipe

1. The Contractor shall haul and deliver along the site all pipe, fittings, and appurtenant appliances. In all handling operations, care shall be exercised to avoid damage to the pipes and fittings.

2. All pipe shall be stored according to manufacturer's recommendation.

3. The Contractor shall use care when handling and moving pipe. Pipe shall be thoroughly inspected for cracks and other defects. Any pipe which, in the opinion of the Project Manager, has been damaged in any way shall be rejected and immediately removed from the job site.

B. Laying the Pipe

1. Only one type of pipe shall be used on each project unless specifically called for on the plans or authorized by the Project Manager. The laying of pipe in the finished trenches shall begin at the lowest point in the line with the spigot end laid in the direction of flow. Single pipe lengths shall be lowered into the trench in an approved manner. The pipes shall be laid to the lines and grades indicated on the plans. The line and grade of the pipe shall be controlled by methods approved by the Project Manager. The Contractor shall maintain the following tolerances from true alignment and grade:

   Alignment +/- 3 inches
   Grade +/- 0.02'

2. Sanitary sewer service wyes shall be located and constructed to the line and grade as indicated on the plans. Construction, marking, and plugging of service stub outs shall be in accordance with the Plans.

3. When flexible pipe is used, the Contractor shall construct and install the pipe in accordance with "Standard Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe" ASTM Designation D 2321. Pipes should be set solidly on a firm, uniform bedding, being careful to prevent soil migration and loss of bottom and lateral support of trench boxes, so as to not disturb the pipe and the integrity of the pipe embedment zone already in place. Voids created by movement of trench boxes or supports shall be properly filled and compacted to densities specified herein. Care shall be taken in preventing excessive point loads on pipe during backfill operations.

4. All pipe bells shall be in bell holes excavated for this purpose. If the bottom of the trench should, for any reason, be excavated and finished too low, it shall be refilled to the proper point with crushed rock and thoroughly compacted by mechanical tamping. Filling and ramming earth beneath the pipe to raise it to grade will not be permitted. Pipe shall be laid through the location where manholes are to be constructed.

C. Jointing the Pipe

1. General
   a. Pipes shall be joined in an approved manner. Open ends of pipes and fittings shall be effectively sealed. When pipe laying is suspended for any reason, watertight bulkheads shall be placed at the end of the pipe.

2. Jointing the Pipe
   a. Gasketed joint pipe shall be joined in the following manner: All dirt, mud and foreign substances should be removed from the spigot and bell. Gaskets should be placed in proper position in the bell of the previously installed pipe. Lubricate gasket, bell and spigot ends with an approved lubricant. Home the pipe and check gasket with feeler gauge to ensure proper sealing. All pipe shall be joined per manufacturer's recommendations.

3.3 SANITARY MANHOLE CONSTRUCTION

A. Manhole Bottom

1. The bottom of each manhole shall be constructed of concrete or precast concrete manhole base sections, as specified in these Specifications. The manhole bottom and inverts shall be constructed as indicated in the plans. The pipe shall be adequately supported during the construction of the base.

2. When constructing a poured concrete manhole floor, manhole water stops shall be installed on all plastic pipes entering manhole walls. The water stop gasket shall be placed within 1 inch of the center of the manhole wall. The top of the poured manhole floor shall be as indicated on the LSP for type of sanitary manhole being constructed.

3. Place water stops according to manufacturers' recommendation.

4. Pipe shall be laid through manholes. The upper portion of the pipe shall be removed after other manhole construction is complete and all debris is removed from the manhole. Where plugs are required on pipe stubs, solvent weld caps shall be installed on all plastic pipe. Follow manufacture's recommendations for sealing cut sections of pipe.

5. Integral precast concrete manhole bottom sections are acceptable. If utilized, all pipe entrance and exit locations shall have water tight compression joints made of rubber which are integrally cast into manhole wall (A-loc or equal). The flexible joints shall meet "Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals" ASTM Designation C 923 for manufacture and meet performance and test requirements of "Standard Specification Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines" ASTM Designation C 969 or "Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure ASTM Designation C 1244. In no case, will the Contractor be allowed to construct pipe enter/exit points on new manholes by breaking out precast to the elevations and deflection angle as shown on the plans. Pipes shall not be laid through manholes when utilizing integral precast manhole base sections. Following placement of the manhole base section and insertion of pipes through manhole wall, the manhole floor and concrete fillet Work shall proceed as shown on the plans.

B. Manhole Adjusting Rings

1. Precast concrete grade rings shall be used to adjust the manhole ring and cover to the required grade when the vertical adjustment is greater than 4 inches. At least one (1) 4 inch grade ring shall be used to allow for future adjustments. Approved mastic type gaskets shall be used to seal the joints between precast adjusting rings, the upper manhole riser, and the cast iron manhole frame (ring). The outside of the cast iron manhole frame shall be finished off with mortar as shown on the Standard Plans.
2. Brick adjusting rings are only to be used when the vertical adjustment of the ring and cover is less than what a standard precast adjusting ring can provide.

C. Precast Concrete Manholes

1. Concrete manholes shall be constructed of precast sections. In the assembly of the wall sections, exercise care in the placement of gaskets to ensure watertight joints. Bottom precast sections shall be placed on top of a double ring of approved mastic type gaskets. All lift holes in precast sections shall be completely filled with an approved non-shrink grout.

D. Cold Weather Construction

1. The Contractor shall take all reasonable precautions to protect all parts of the Work from damage due to freezing or as a result of winter weather conditions. The Contractor shall cover and protect all brick and concrete masonry and shall supply artificial heat, if necessary, in order that the temperature of such masonry Work shall not fall below 45o degrees F for a period of at least seventy two (72) hours after the structure has been constructed.

3.4 CONCRETE PLACEMENT

A. Place cast-in-place concrete according to ACI 318.

3.5 CONNECTIONS

A. Connect nonpressure, gravity-flow drainage piping to building's sanitary building drains specified in Section 221316 "Sanitary Waste and Vent Piping."

B. Make connections to existing piping and underground manholes.

1. The Contractor shall make all connections to existing sanitary sewers as shown on the plans. Existing manhole bottoms shall, if necessary, be reconstructed in substantially the same manner specified for new manhole bottoms. The manhole walls shall be reconstructed as directed by the Project Manager. No pipe less than 8 inches in diameter shall be tapped into the manhole.

2. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye fitting plus 6-inch overlap with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi .

3. Protect existing piping and manholes to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

4. The Contractor shall install plugs in the appropriate locations of all new sanitary sewers prior to, or during construction, and remove the plugs after construction using approved plugging methods and types to prevent any and all storm runoff, ground water and other foreign material from entering existing wastewater collection lines. Construction Work shall not proceed until the necessary plugging has been accomplished.

   Prior to line acceptance testing, any and all water and other foreign material must be removed by the Contractor from the new lines by pumping or other means approved by the Project Manager.

   The Contractor shall be responsible for checking each plug daily and, if maintenance is required, shall immediately take corrective action by repairing or replacing the plugs, as applicable to the situation.

3.6 IDENTIFICATION

A. Arrange for installation of green warning tapes directly over piping and at outside edges of underground manholes.

1. Use detectable warning tape over ferrous piping.
2. Use detectable warning tape over nonferrous piping and over edges of underground manholes.

3.7 FIELD QUALITY CONTROL

A. General

1. Line acceptance tests shall be required for each section of sanitary sewer constructed between manholes or junction structures. Line acceptance tests shall consist of hydrostatic or low pressure air testing for leakage; deflection testing for all plastic pipe; and internal television inspection. In addition, all PVC pipe furnished under the Standard Specification for Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings ASTM F-679 reference shall be checked to ascertain that the pipe being furnished meets the acceptable T-1 minimum wall thickness requirements. Manholes and junction structures shall also be tested for acceptable performance as hereinafter provided. Except for said T-1 wall thickness checking, the tests specified below shall not be initiated until the related backfill is compacted in place; the line, manholes, and structures have been cleaned of all interfering debris; and suitable access for necessary testing equipment is provided.

2. The Contractor shall furnish all labor, tools, and equipment to perform all the tests specified hereinafter and only in the presence of the Project Manager or observer, except where such tests are specifically designated as being the responsibility of the Owner. The methods and the equipment used for the tests shall be approved by the Project Manager. No direct payment will be made for the testing required herein. The costs associated with the testing are to be considered subsidiary to the costs of the sewer lines and manholes.

3. Except for pipe replacement projects where existing services must be reconnected as the new replacement pipe is being laid, or as otherwise directed by the Project Manager, live wastewater flow shall not be permitted in the sanitary sewer line until all of the following tests are completed and found acceptable. With the Project Manager's approval, dry taps to the new line may be permitted prior to testing, provided that the service line stub outs are temporarily capped off in an air-tight manner.

B. Line Acceptance Tests

1. Hydrostatic Tests

a. The following hydrostatic test may be used to meet line leakage testing requirements, or, alternately, the Contractor may at his option substitute the low pressure air testing procedure specified below. For hydrostatic testing, the maximum acceptable leakage rate shall be 0.0008 gallons per hour per lineal foot per inch) diameter. The minimum head at the upper manhole or structure shall be 5 feet more than the groundwater level surrounding the pipe. The groundwater level shall be ascertained prior to testing by connecting a clear plastic tube to the pipe nipple installed as previously described in this chapter. The pipe nipple shall then be capped. The Contractor shall use a stand pipe not greater than 4 inches in diameter that is connected to a plug in the segment to be tested. The stand pipe shall be of sufficient length to maintain the proper test head. The test period shall be for a minimum of one (1) hour. If the leakage rate is in excess of the amount specified above, the Contractor shall make such repairs as are necessary and retest the line until these requirements are met.

b. The Contractor, at his option, may combine the above hydrostatic test with the exfiltration tests for the connecting manholes or structures specified hereinafter, provided that the highest test head and longest test time for the line segment and manholes in combination are met. If the combined leakage rate allowance is exceeded, the Contractor shall isolate the problem(s), make the necessary repairs, and retest the line segment and manholes separately or in combination until found acceptable.

2. Air Tests

a. Low pressure air testing may be used in lieu of hydrostatic testing specified above. The equipment shall be supplied with positive on/off valves and regulator relief valves set at no more than 8 psig for pressurizing the sewer line. The pressure gauge shall have a range of zero to ten psig, with 0.1 psig divisions and an accuracy of 0.05 psig. The pressure gauge shall have been calibrated and certified as to accuracy within the past year. The Contractor may be directed to obtain a suitable pressure gauge if for any reason the gauge on hand has questionable accuracy.

The test procedures required shall be as follows:

1) Prior to testing, the backfill shall have been placed and compaction requirements fully met, and the line shall have been cleaned of all foreign matter.

2) All equipment shall be checked for proper functioning prior to actual line testing. Use one (1) length of spare pipe laid on the ground; pressurize

pneumatic plugs on each end to 25 psig; and internally pressurize the pipe to 5 psig. The plugs shall hold without bracing, and the line pressure gauge shall show no loss of air. Exercise proper safety precautions around the pressurized line in being prepared for possible blow out of the plugs.

3) After all equipment has been inspected, proceed with actual line testing. Insert the pneumatic plugs at each end of the test segment; extend air lines to the top of the manhole; make sure no personnel remain in manholes; then carefully pressurize the plugs. Low pressure air shall be introduced into the sealed line until the internal pressure reaches 4 psig. Allow at least two (2) minutes for the air pressure to stabilize. Once the stabilization period has ended, reduce the internal pressure within the line segment to 3.5 psig. Disconnect the air supply to the control panel and begin testing. The portion of the line being tested shall be termed acceptable if the time required in minutes for the pressure to decrease 1 psig shall not be less than the time shown in the following table:

Pipe Diameter (inches)	Minimum Time (minutes)
6	5:40
8	7:34
10	9:26
12	11:20
15	14:10
18	17:00
21	19:50
24	22:40
27	25:30
30	28:20

4) When the presence of ground water is evident above the invert of the sewer line being tested, a pressure correction will be added to the 3.5 psig normal start test pressure. Under this condition, the air test pressure shall be increased 0.433 psig for each foot the groundwater level is above the invert of the pipe. All gauge pressures shall be increased by this amount. If the current prevailing groundwater is more than twenty seven (27) inches above the invert of the pipe, an infiltration or exfiltration test may be required by the Project Manager. Thus, internal air pressures should never exceed 5.0 psig.

5) On sewers large enough to permit entry by personnel, the Contractor may air test individual joints using the same acceptance criteria as specified above, provided the equipment and procedures are first approved by the Project Manager.

3. Television Inspection

a. Internal television inspection of new sanitary sewers will be performed by the Contractor in the presence of the Project Manager at no cost to the Owner. In most cases, television inspection will be scheduled no earlier than thirty (30) days after the installation of the pipe and shall be done at the same time and in conjunction

with final deflection testing, as specified below, and after all line leakage and manhole exfiltration testing has been completed and found acceptable. Televised lines shall be termed 'acceptable' if no defects are found, such as open joints, breaks, cracks, excessive pipe deformation, intrusions, depositions and debris left in the line, or excessive vertical or horizontal misalignment. Follow-up TV inspection activities that may be required as a result of repairs to defective new sanitary sewers will be performed at no additional cost to the Owner.

b. Deflection Testing

1) Deflection tests shall be made on all pipe installed on the project. The Contractor shall perform his own deflection testing in the presence of the Project Manager to screen out obvious defects prior to completing other Work that may later be disturbed by re-excavation to repair defects.

2) Final deflection testing shall not be done sooner than thirty (30) days after backfill has been compacted in place by the Contractor, unless the time limitation is expressly waived by the Project Manager. The maximum allowable deflection for any pipe shall be five percent (5%) of the base inside diameter of the pipe.

3) The mandrel shall be pulled through the test segment using a pulling force equivalent to hand power. The line shall be termed "acceptable" if, during final deflection testing, the mandrel passes completely through the line without restriction. In no case shall excessive force be applied in pulling the mandrel that may damage the pipe or that may erroneously indicate that deflection was within acceptable limits by temporarily expanding the pipe.

4) If excessive deflection is indicated, the Contractor shall make necessary repairs at his own expense and the line retested until found acceptable. No additional time waiting period shall apply for retesting following repair of the line and proper recompaction of the backfill, unless otherwise directed by the Project Manager.

5) It will be the responsibility of the Contractor to perform the mandrel test with the Project Manager in observance.

C. Manhole Performance Tests

1. All manholes shall be constructed so as to be free from infiltration. The interior of the manhole shall be observed during the flushing operation for location of any deficiencies. The manhole shall also remain free from visible infiltration during the two-year period of guarantee. If any infiltration is observed during that period, the Contractor shall be required to make any necessary repairs.

2. Exfiltration Tests shall be performed on all manholes and pipe junction structures, except where groundwater conditions do not permit proper test head levels to be achieved, as specified below. Test procedures shall be as follows:

a. Insert pneumatic plugs in all lines entering and leaving the manhole. Extend air lines to the top of the manhole, and make sure all personnel are out of the manhole. Carefully pressurize each plug to25 psig to seal each line.

b. Fill the manhole to a level at least 5 feet above the groundwater level surrounding the manhole, or to an 8 foot depth, whichever is higher. Allow the water to stand until maximum absorption has been reached, then refill the manhole if necessary to its original depth. If the required test head would be higher than the bottom of the frame for the manhole cover, either the exfiltration test head shall be decreased or the test waived, at the discretion of the Project Manager.

c. After the manhole has been refilled, the manhole exfiltration test shall begin and shall last for a period of at least four (4) hours. The manhole shall be considered "acceptable" if the equivalent rate of exfiltration (leakage) does not exceed 0.0016 gallons per hour per vertical foot of test head per inch diameter of the manhole. For convenience, the following table may be used to evaluate allowable leakage rate (for the cylindrical portion of the manhole only; for other structural shapes, adjust the maximum leakage rate and head drop on the basis of equivalent diameter for the same perimeter):

Nominal Manhole Diameter inches	Manhole Volume Gal. per VF	Maximum Leakage Rate Gal./VF/hr.	Maximum 4-Hr. Head Drop in inches
4	94	0.08	0.30
5	147	0.10	0.25
6	211	0.12	0.20

3. Vacuum Testing

a. Vacuum testing of manholes, when used, shall be performed on all manholes and pipe junction structures to conform to the requirements of Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test" ASTM Designation C 1244. Test procedures shall be as follows:

1) All lift holes shall be plugged with an approved non-shrink grout.

2) All pipes entering the manhole shall be plugged, taking care to securely brace the plugs from being drawn into the manhole.

3) The test head shall be placed at the top of the manhole in accordance with the manufacturer's recommendation. Top of the manhole is considered to be the top of the casting forming the manhole lid.

4) A vacuum of 10 inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop 1 inch of mercury. The manhole shall pass if the time is greater than

the time listed in the table on the preceding page for the depth and diameter of the manhole being tested.

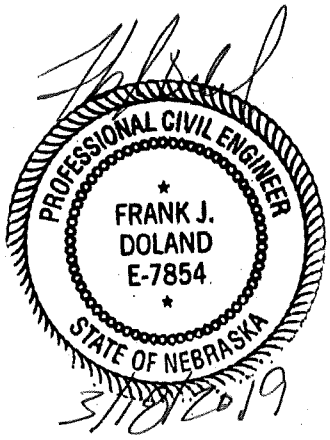
5) If the manhole fails the initial test, necessary repairs shall be made with a non-shrink grout while the vacuum is still being drawn. Retesting shall proceed until a satisfactory test is obtained.

Manhole Depth (ft)	Manhole Diameter (inches)								
	30	33	36	42	48	54	60	66	72
	Time (seconds)								
8	11	12	14	17	20	23	26	29	33
10	14	15	18	21	25	29	33	36	41
12	17	18	21	25	30	35	39	43	49
14	20	21	25	30	35	41	46	51	57
16	22	24	29	34	40	46	52	56	67
18	25	27	32	38	45	52	59	65	73
20	28	30	35	42	50	53	65	72	81
22	31	33	39	46	55	64	72	79	89
24	33	36	42	51	59	64	78	87	97
26	36	39	46	55	61	75	85	94	105
28	39	42	49	59	69	81	91	101	113
30	42	45	53	63	74	87	98	108	121

3.8 CLEANING

A. Clean dirt and superfluous material from interior of piping.

END OF SECTION 221313



MONOLITH

SANITARY SEWER PLANS AT THE MONOLITH 10KT CB & H PLANT

NEAR HALLAM, NEBRASKA

SHEET INDEX

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MANUFACTURER'S DETAILS / SHOP DRAWINGS / CUT SHEETS	15-16

GENERAL NOTES

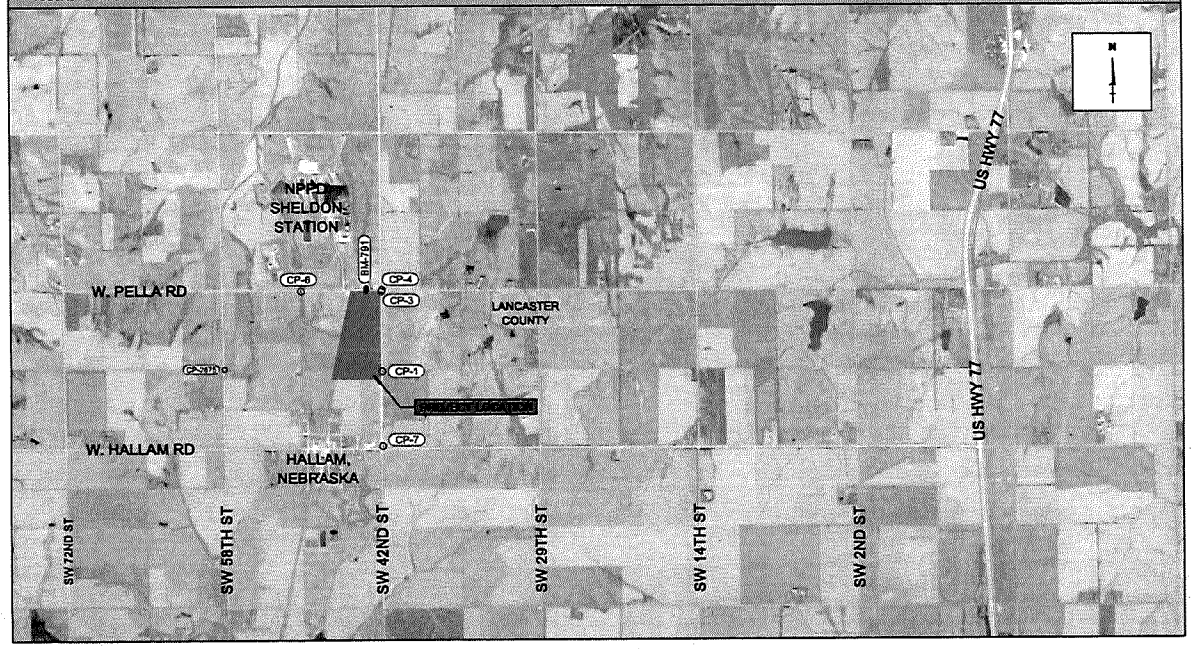
1. THE APPROXIMATE LOCATION OF KNOWN CABLES AND UTILITIES ARE INDICATED ON THE PLANS. ALL CABLES AND UTILITIES MAY NOT BE SHOWN. PRIOR TO BEGINNING ANY WORK ALL CONTRACTORS SHALL HAVE CONTACTED ONE CALL TO LOCATE TELEPHONE, GAS, WATER, SEWER, COMMUNICATION, LIGHTING LINES AND OTHER CABLES / UTILITES WITHIN THE CONSTRUCTION SITE.
2. EXISTING PAVEMENT, TURF, ROADS, CABLES, UTILITIES, AND INCIDENTALS THAT ARE DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED BY THE CONTRACTOR AT NO COST TO MONOLITH.
3. THE ITEMS IDENTIFIED IN THE SCHEDULE OF APPROXIMATE QUANTITIES ARE INTENDED TO IDENTIFY THE MAJOR WORK ITEMS. ALL ITEMS NOT SPECIFICALLY MENTIONED SHALL BE CONSIDERED SUBSIDIARY TO BID ITEMS TO WHICH THEY ARE RELATED AND WILL NOT BE CONSIDERED AS PAY ITEMS.
4. THE CONTRACTOR SHALL PRESERVE ALL SURVEY CONTROL. THE CONTRACTOR IS RESPONSIBLE FOR ALL STAKING ON THIS PROJECT.
5. PRIOR TO MOVING OFF THE JOB THE CONTRACTOR SHALL NOTIFY MONOLITH TO PERFORM A FINAL WALK-THROUGH INSPECTION.
8. EXCAVATIONS THAT WILL BE OCCUPIED BY PERSONNEL SHALL BE MADE IN ACCORDANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) CONSTRUCTION STANDARD-29 CFR PART 1926, SUBPART P-EXCAVATIONS. OSHA STATES THAT A SOIL SHALL BE RECLASSIFIED IF THE PROPERTIES, FACTORS OR CONDITIONS AFFECTING THE SOIL'S CLASSIFICATION CHANGE IN ANY WAY. SHEET PILING AND/OR SHORING WILL BE NECESSARY IF THE SIDES OF THE EXCAVATION CANNOT BE SLOPED TO MEET OSHA REGULATIONS.

SURVEY CONTROL POINTS

POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP-1	107,388.012	138,519.935	1477.74	5/8" REBAR TIE
CP-3	110,045.836	138,505.948	1462.44	1" I.D. PIPE TIE
CP-4	110,111.658	138,523.104	1463.79	1" PCAP (ALLIED)
CP-6	110,069.502	135837.926	1398.88	3/4" REBAR TIE
CP-7	104,894.245	138,526.885	1485.70	NGS HALLAM 1947 NO. 2
CP-2675	107,470.655	133,276.180	1462.50	1" I.D. PIPE TIE
BM-791	110.112	138,007	1456.50	60D SPIKE

HORIZONTAL DATUM: LANCASTER COUNTY GRID
VERTICAL DATUM: NAVD88

VICINITY MAP



SCHEDULE OF APPROXIMATE QUANTITIES

ITEM DESCRIPTION	UNIT	QUANTITY
MOBILIZATION	LS	1
CONSTRUCTION STAKING	LS	1
EXCAVATION	CY	10150
TOPSOIL	CY	1040
3" PVC (SDR 21) R.J. SANITARY SEWER FORCE MAIN	LF	1199
4" PVC (SDR 26) SANITARY SEWER LINE	LF	112
8" PVC (SDR 26) SANITARY SEWER LINE	LF	298
3" x 11.25 DEG. BEND, M.J.	EA	2
3" x 22.5 DEG. BEND, M.J.	EA	2
3" x 45 DEG. BEND, M.J.	EA	2
3" RETAINER GLAND	EA	12
4" CROSS	EA	3
4" TEE	EA	1
SANITARY SEWER SERVICE CONNECTION	EA	1
SANITARY SEWER MANHOLE	EA	2
SANITARY SEWER LIFT STATION	EA	1
1,500 GALLON SEPTIC TANK	EA	2
SEPTIC LEACH FIELD CHAMBERS	LF	656
CONCRETE FOR THRUST / RESTRAINT BLOCKS	CY	2.2
BOLLARDS	EA	7
SEED, MULCH & FERTILIZE	AC	2

811.com Diggers Hotline 811

PRIOR TO CONSTRUCTION:

CALL: 1-800-331-5666 FOR LOCATION OF UNDERGROUND TELEPHONE, ELECTRIC, GAS MAINS, CABLE TELEVISION, WATER, SEWER OR ANY OTHER UTILITIES.

NOTE: EXISTING UNDERGROUND AND OVERHEAD UTILITIES AND DRAINAGE STRUCTURES HAVE BEEN PLOTTED FROM AVAILABLE INFORMATION AND THEREFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS THE RESPONSIBILITY OF THE INDIVIDUAL CONTRACTORS TO EXACTLY LOCATE AND PROTECT EACH EXISTING UTILITY BEFORE AND DURING ACTUAL CONSTRUCTION.

PROFESSIONAL CIVIL ENGINEER
FRANK J. DOLAND
E-7854
STATE OF NEBRASKA

NO.	REVISION	DATE

COVER SHEET

MONOLITH
SANITARY SEWER
HALLAM, NEBRASKA

benesch
Allied Benesch & Company
601 East Second Street
Grand Island, Nebraska 68801
402-475-2200

PROJECT 111270.00
DATE 3/18/2019
SHEET 1 OF 16

V:\Hall\111200\111270.00\Eng_Dept\Sheets\Sanitary Sewer\01 - Coversht.dgn - 4.000,0000 ft/in. - 3/18/2019

DESIGN CALCULATION NOTES

LEACH FIELD DATA

AREA OF LATERALS IS SIZED BASED ON 103 FUTURE EMPLOYEES.

NONRESIDENTIAL WASTE WATER FLOW WAS DETERMINED IN COMPLIEANCE WITH THE "ONSITE WASTEWATER TREATMENT SYSTEMS MANUAL" FROM THE US DEPARTMENT OF ENVIRONMENTAL PROTECTION AGENCY. WE UTILILIZED TABLE 3-4 AND SELECTED THE TYPE OF FACILILITY AS "INDUSTRIAL (SANITARY WASTE ONLY) RANGE OF FLOWS, 7-16 GALLONS PER DAY. WE SELECTED THE CONSERVATIVE FLOW RATE OF 16 GALLONS PER DAY, PER EMPLOYEE, WHICH EQUATES TO 1,648 GALLONS PER DAY.

ABSORBTION TRENCH SIZING

REQUIRED AREA (SQ FT) = DESIGN FLOW (GPD) X 0.20 X PERCOLATION^0.5 IN / HR

1,879 SQ FT = 1648 GPD X 0.20 X (32.5 IN / HR) ^0.5

TRENCH

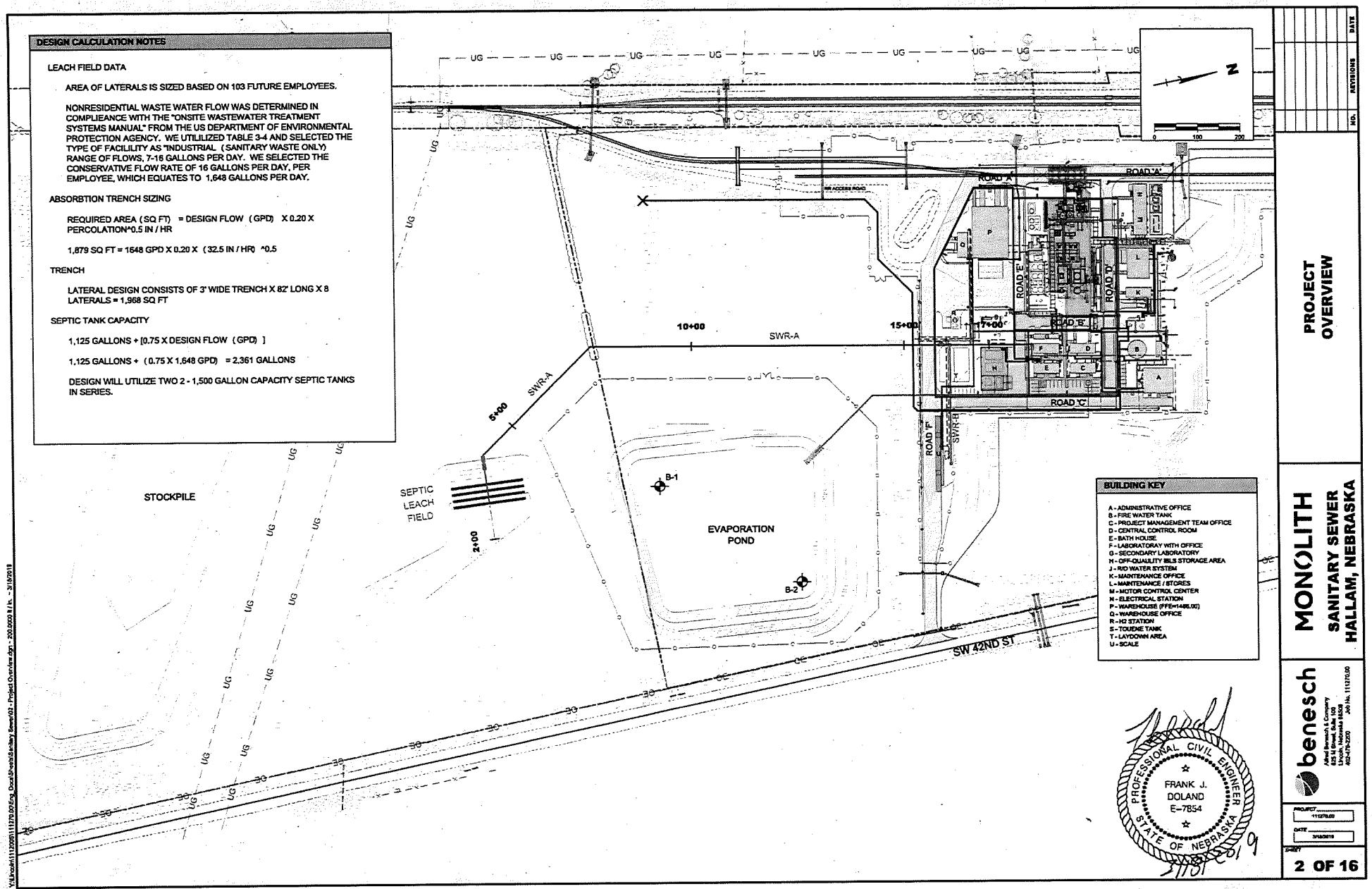
LATERAL DESIGN CONSISTS OF 3' WIDE TRENCH X 82' LONG X 8 LATERALS = 1,958 SQ FT

SEPTIC TANK CAPACITY

1,125 GALLONS + [0.75 X DESIGN FLOW (GPD)]

1,125 GALLONS + (0.75 X 1,648 GPD) = 2,361 GALLONS

DESIGN WILL UTILIZE TWO 2 - 1,500 GALLON CAPACITY SEPTIC TANKS IN SERIES.



BUILDING KEY

A - ADMINISTRATIVE OFFICE
B - FIRE WATER TANK
C - PROJECT MANAGEMENT TEAM OFFICE
D - CENTRAL CONTROL ROOM
E - BATH HOUSE
F - LABORATORAY WITH OFFICE
G - SECONDARY LABORATORY
H - OFF-QUALILITY BILS STORAGE AREA
J - R/O WATER SYSTEM
K - MAINTENANCE OFFICE
L - MAINTENANCE / STORES
M - MOTOR CONTROL CENTER
N - ELECTRICAL STATION
P - WAREHOUSE (FFE=1486.00)
Q - WAREHOUSE OFFICE
R - H2 STATION
S - TOLUENE TANK
T - LAYDOWN AREA
U - SCALE

PROFESSIONAL CIVIL ENGINEER
FRANK J. DOLAND
E-7854
STATE OF NEBRASKA
3/15/2019

NO. | REVISIONS | DATE

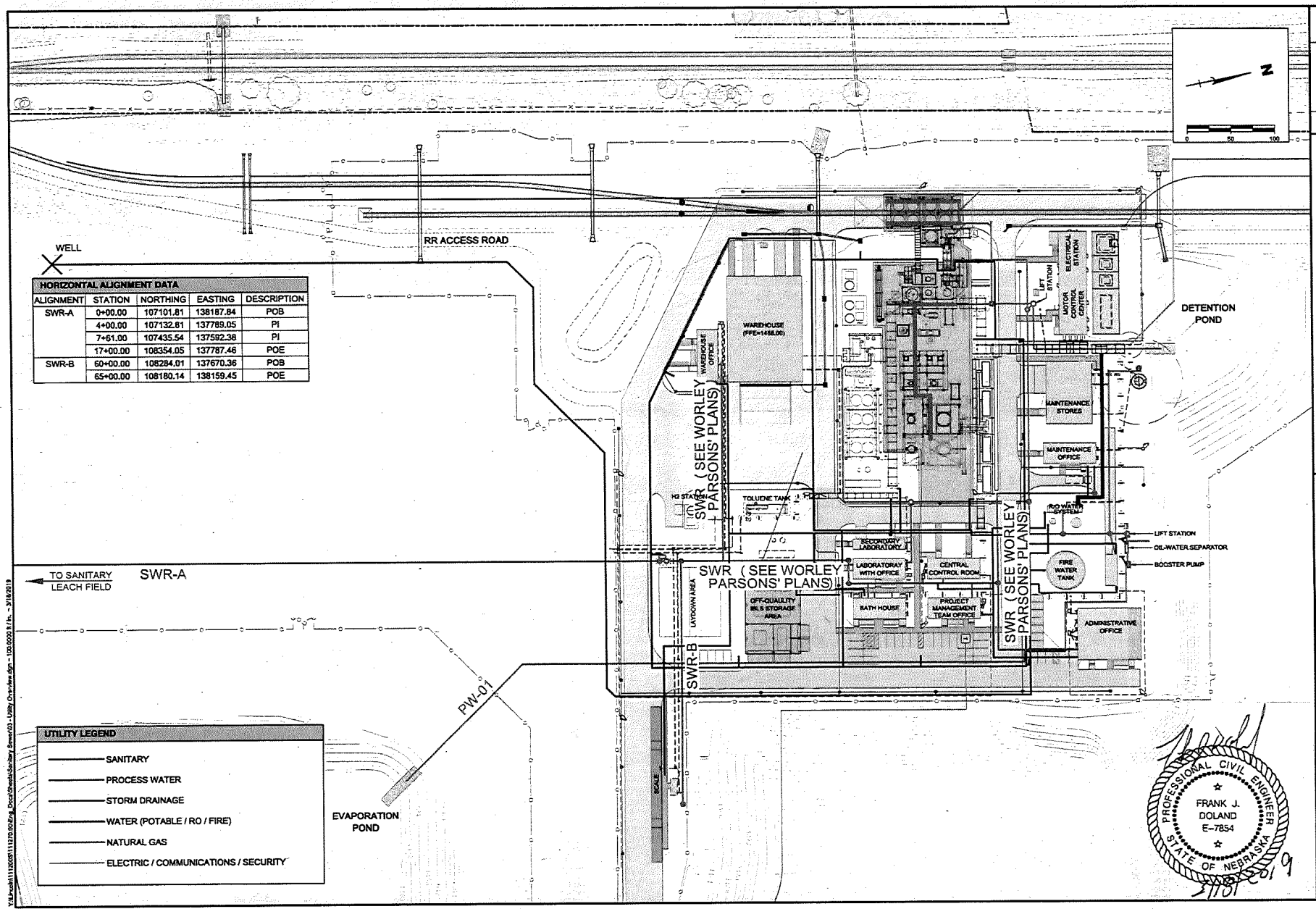
PROJECT OVERVIEW

MONOLITH
SANITARY SEWER
HALLAM, NEBRASKA

benesch
Alfred Benesch & Company
645 M Street, Suite 200
Lincoln, Nebraska 68508
402-476-2200
Job No. 111270.00

PROJECT 111278.00
DATE 3/15/2019
SHEET 2 OF 16

Y:\Arcdoc\111270\05\Eng_Docs\Sheets\Sanitary Sewer\02 - Project Overview.dgn - 200,0000 ft / in. - 3/15/2019



HORIZONTAL ALIGNMENT DATA				
ALIGNMENT	STATION	NORTHING	EASTING	DESCRIPTION
SWR-A	0+00.00	107101.81	138187.84	POB
	4+00.00	107132.61	137789.05	PI
	7+61.00	107435.54	137592.38	PI
	17+00.00	108354.05	137787.46	POE
SWR-B	60+00.00	108284.01	137670.36	POB
	65+00.00	108180.14	138159.45	POE

UTILITY LEGEND

- SANITARY
- PROCESS WATER
- STORM DRAINAGE
- WATER (POTABLE / RO / FIRE)
- NATURAL GAS
- ELECTRIC / COMMUNICATIONS / SECURITY

PROFESSIONAL CIVIL ENGINEER
FRANK J. DOLAND
E-7854
STATE OF NEBRASKA
3/10/2019

NO.	REVISIONS	DATE

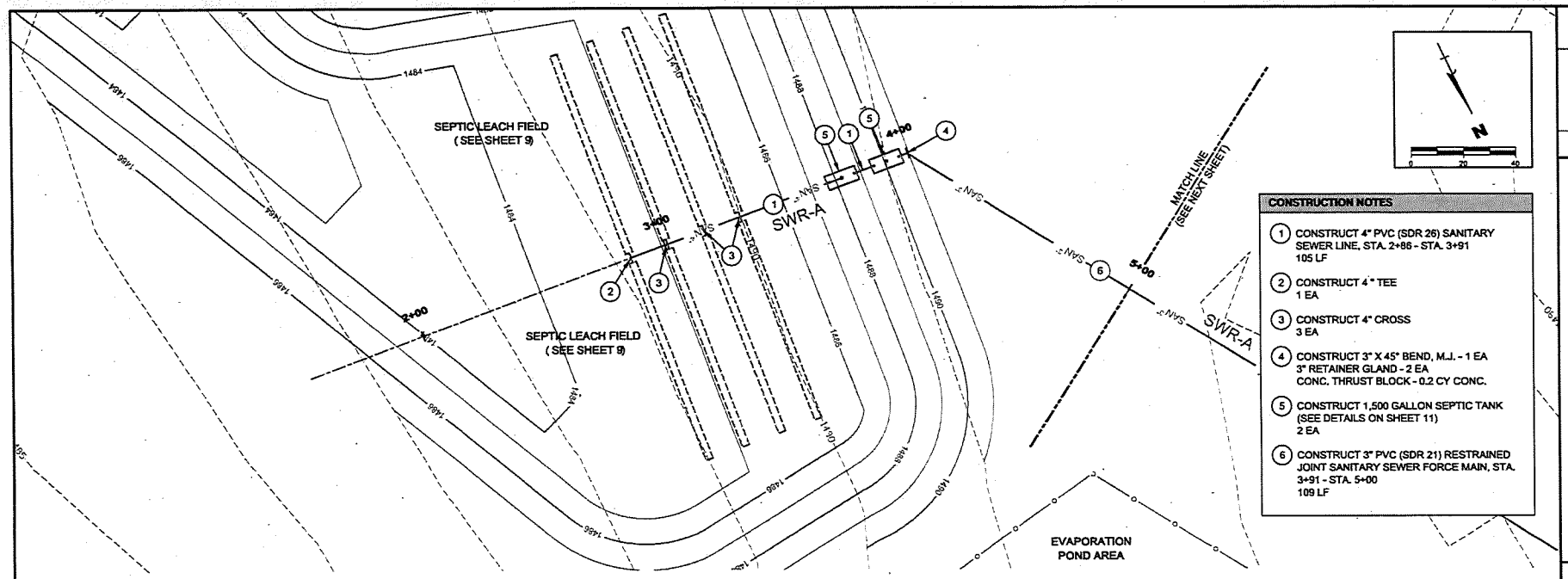
UTILITY OVERVIEW

MONOLITH
SANITARY SEWER
HALLAM, NEBRASKA

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Alfred Benesch & Company
1200 N. Street, Suite 1203
Lincoln, Nebraska 68508
402-479-2200
Job No. 111370.00

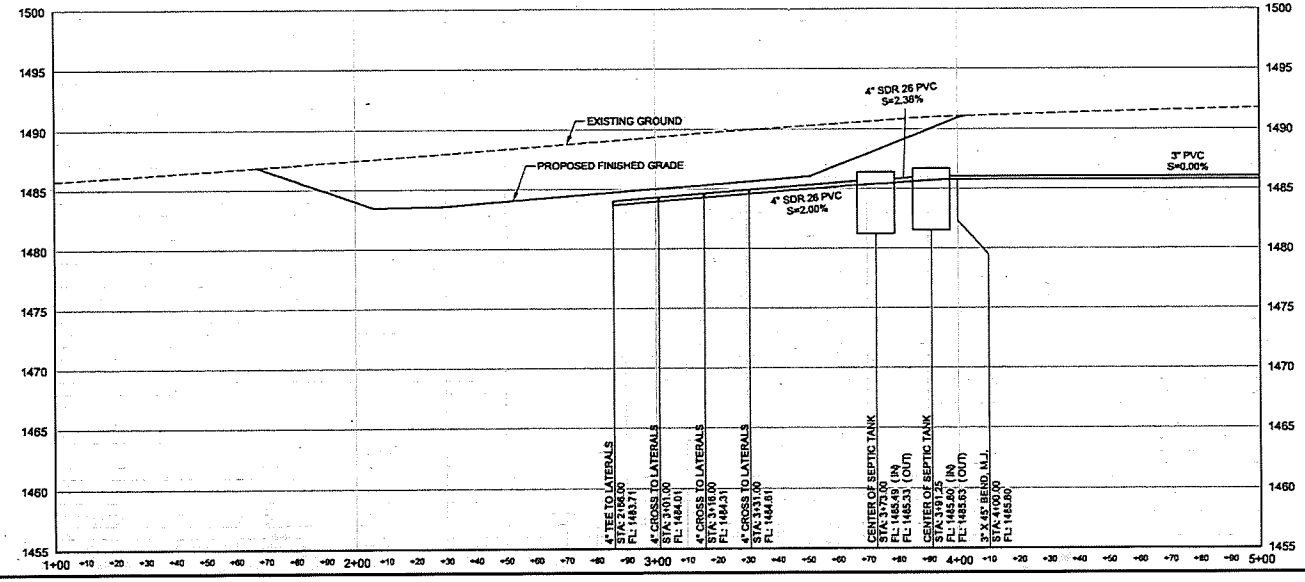
PROJECT 111370.00
DATE 3/18/2019
SHEET **3 OF 16**

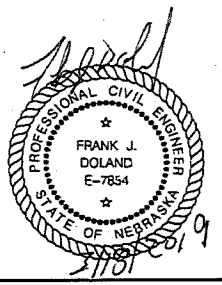
Y:\Lincoln\111370\5\111370.05\Eng Docs\Sheets\Sanitary Sewer\03 - Utility Overview.dgn - 1:50.00000 ft / in. - 3/18/2019



CONSTRUCTION NOTES

1. CONSTRUCT 4" PVC (SDR 26) SANITARY SEWER LINE, STA. 2+86 - STA. 3+91
   105 LF
2. CONSTRUCT 4 " TEE
   1 EA
3. CONSTRUCT 4" CROSS
   3 EA
4. CONSTRUCT 3" X 45° BEND, M.J. - 1 EA
   3" RETAINER GLAND - 2 EA
   CONC. THRUST BLOCK - 0.2 CY CONC.
5. CONSTRUCT 1,500 GALLON SEPTIC TANK (SEE DETAILS ON SHEET 11)
   2 EA
6. CONSTRUCT 3" PVC (SDR 21) RESTRAINED JOINT SANITARY SEWER FORCE MAIN, STA. 3+91 - STA. 5+00
   109 LF





NO.	REVISIONS	DATE

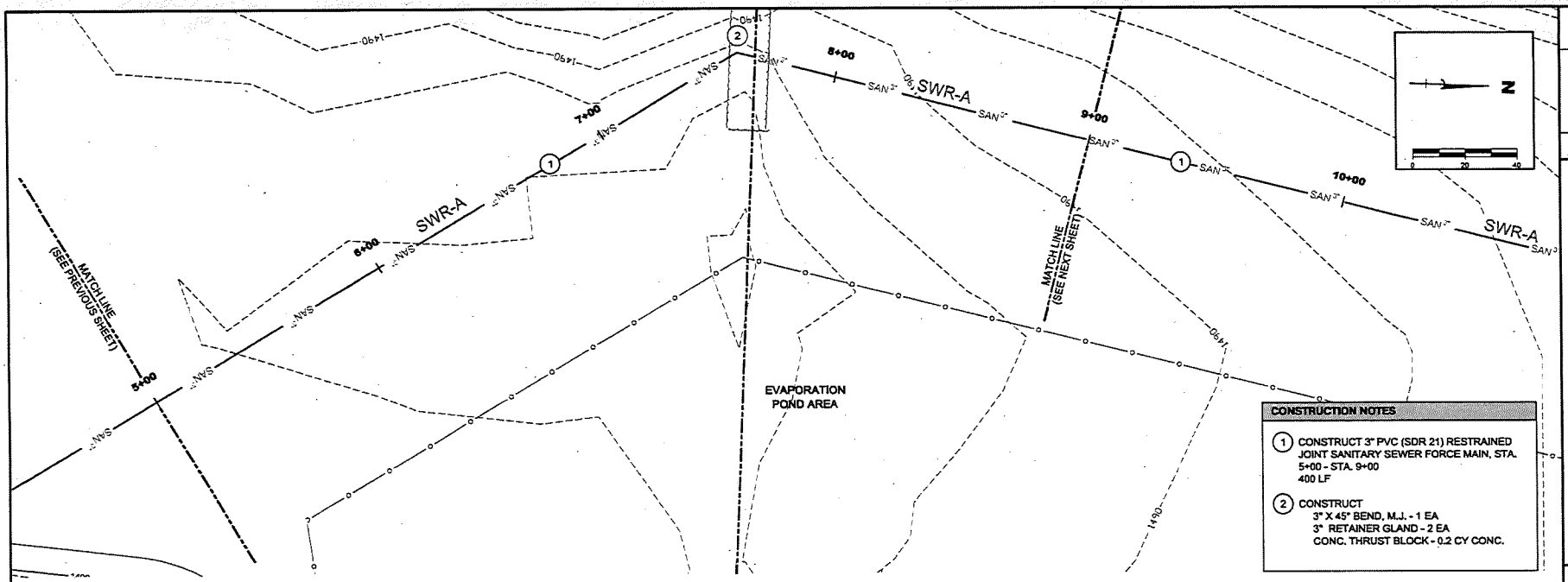
SANITARY SEWER LINE
PLAN-PROFILE
(SWR-A)

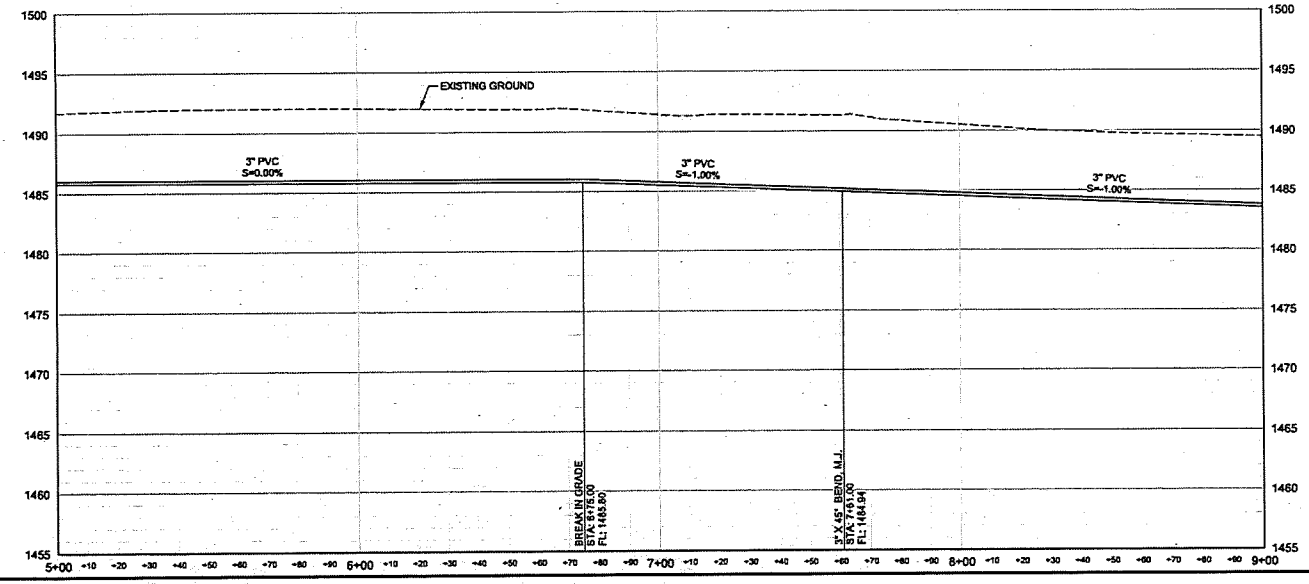
MONOLITH
SANITARY SEWER
HALLAM, NEBRASKA

benesch
Alfred Benesch & Company
1500 Lincoln Square
Lincoln, Nebraska 68508
402-479-2200
Job No. 111278.00

PROJECT 111278.00
DATE 3/18/2019
SHEET **4 OF 16**

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CONSTRUCTION NOTES

1. CONSTRUCT 3" PVC (SDR 21) RESTRAINED JOINT SANITARY SEWER FORCE MAIN, STA. 5+00 - STA. 9+00
   400 LF
2. CONSTRUCT
   3" X 45° BEND, M.J. - 1 EA
   3" RETAINER GLAND - 2 EA
   CONC. THRUST BLOCK - 0.2 CY CONC.

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E-7854
STATE OF NEBRASKA

3/18/19

NO.	REVISIONS	DATE

SANITARY SEWER LINE PLAN-PROFILE (SWR-A)

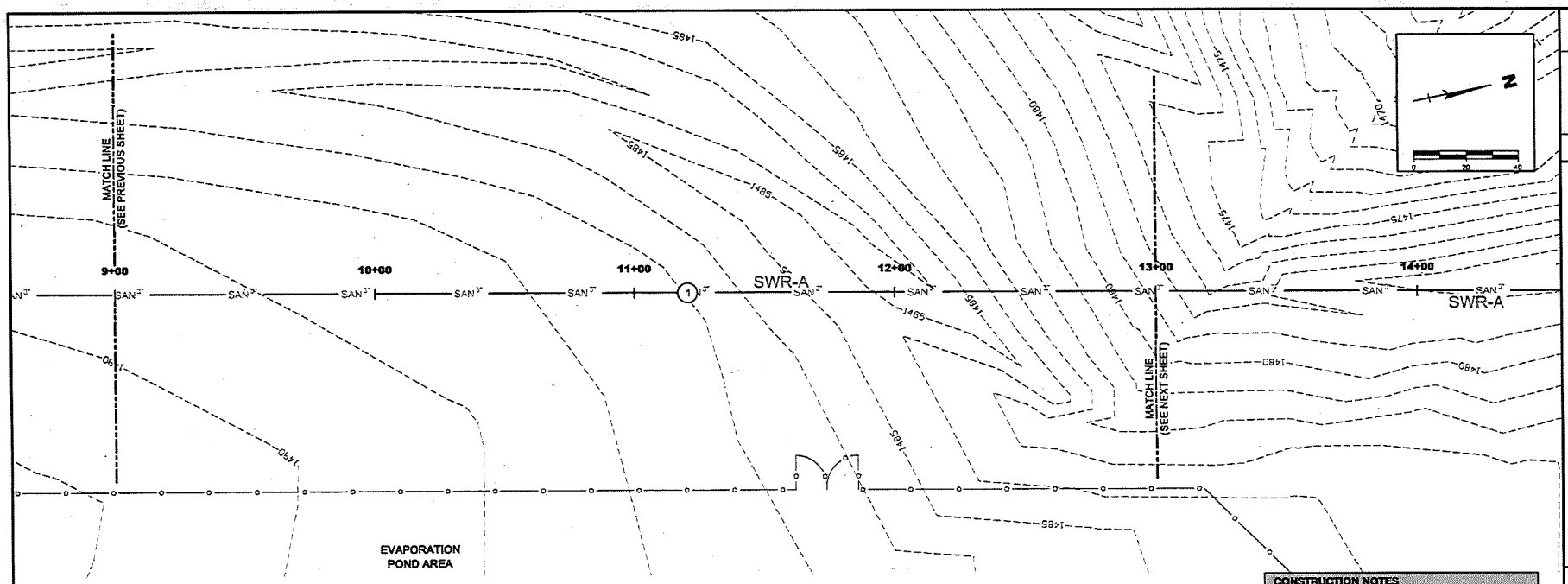
MONOLITH
SANITARY SEWER
HALLAM, NEBRASKA

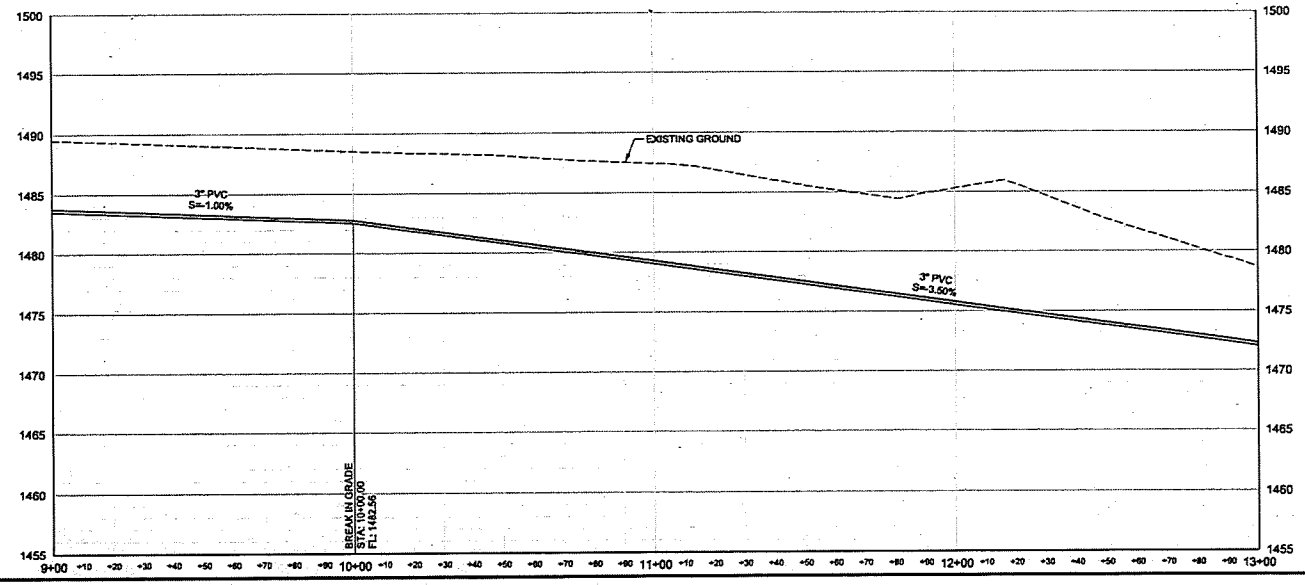
benesch
Albert Benesch & Company
1515 N. Saddle Creek Rd., Suite 100
Omaha, Nebraska 68102
402-476-2200

Job No. 111270.00

PROJECT 111270.00
DATE 3/18/2019
SHEET **5 OF 16**

V:\Hallam\111270\05\111270.00Eng_Docs\Sheets\Sanitary Sewer\05 - Sanitary Plan-Profile (2).dgn -- 40.0000 ft / in. -- 3/18/2019





CONSTRUCTION NOTES

1. CONSTRUCT 3" PVC (SDR 21) RESTRAINED JOINT SANITARY SEWER FORCE MAIN, STA. 9+00 - STA. 13+00
   400 LF

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E-7854
STATE OF NEBRASKA

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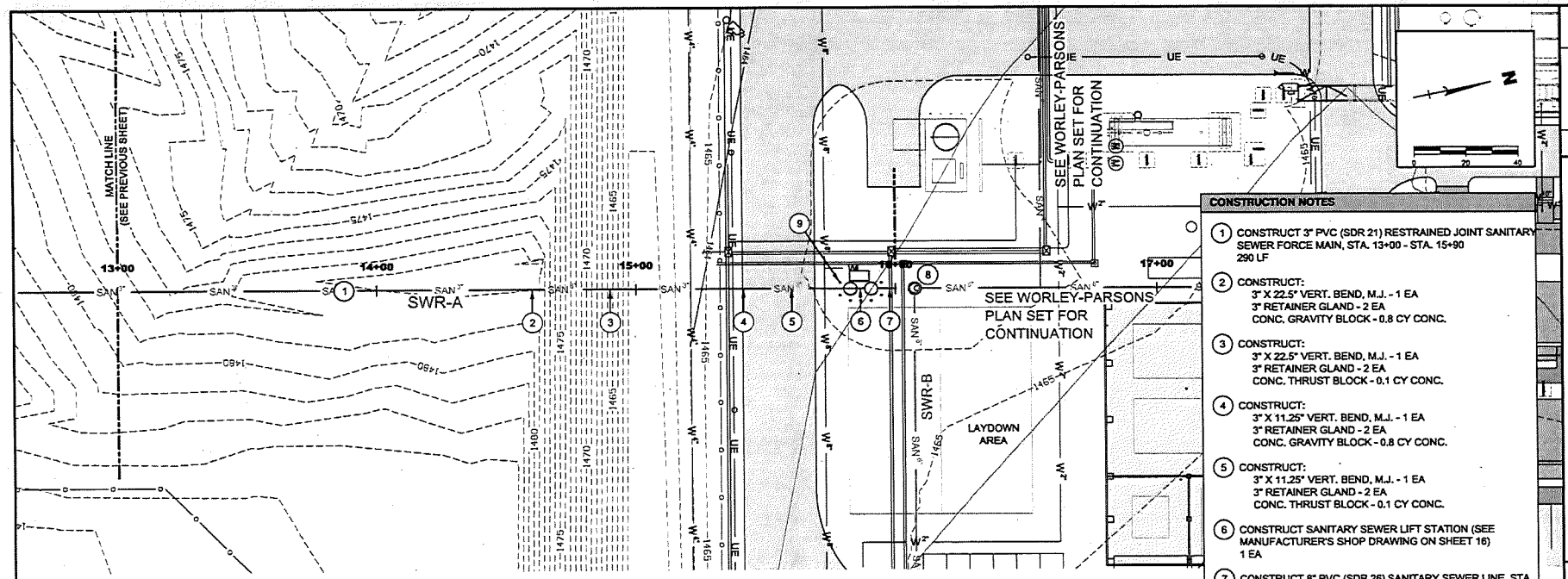
SANITARY SEWER LINE PLAN-PROFILE (SWR-A)

MONOLITH
SANITARY SEWER
HALLAM, NEBRASKA

benesch
Alfred Benesch & Company
825 M Street, Suite 100
Lincoln, Nebraska 68508
402-479-2200
Job No. 111270.00

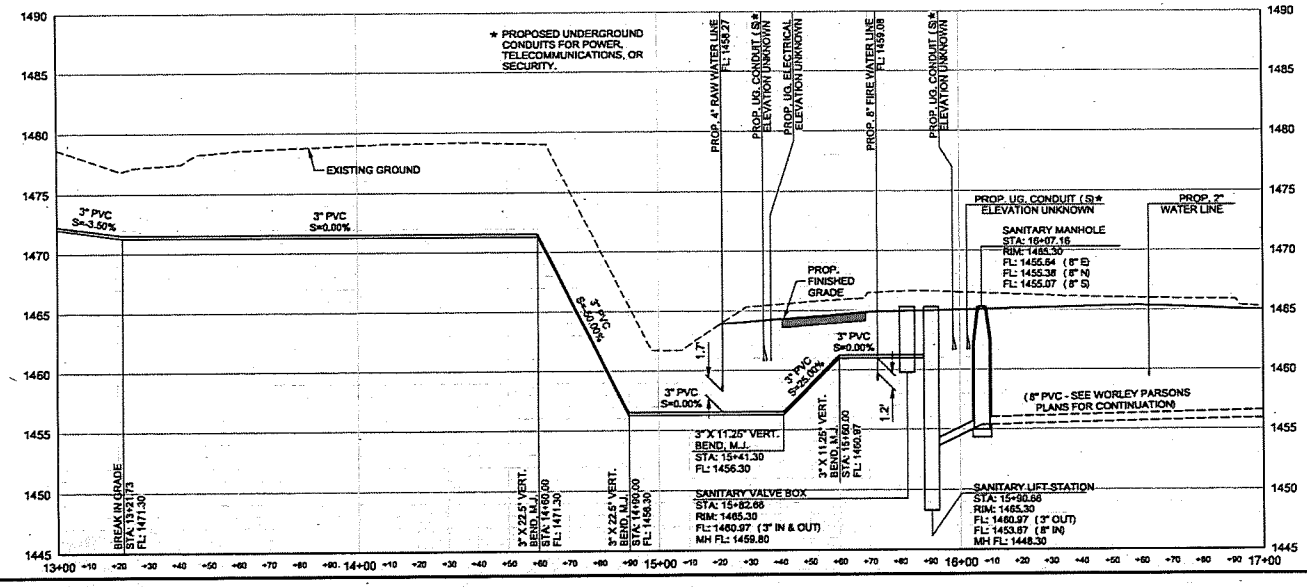
PROJECT 111270.00
DATE 3/14/2019
SHEET **6 OF 16**

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CONSTRUCTION NOTES

1. CONSTRUCT 3" PVC (SDR 21) RESTRAINED JOINT SANITARY SEWER FORCE MAIN, STA. 13+00 - STA. 15+90
   290 LF
2. CONSTRUCT:
   3" X 22.5° VERT. BEND, M.J. - 1 EA
   3" RETAINER GLAND - 2 EA
   CONC. GRAVITY BLOCK - 0.8 CY CONC.
3. CONSTRUCT:
   3" X 22.5° VERT. BEND, M.J. - 1 EA
   3" RETAINER GLAND - 2 EA
   CONC. THRUST BLOCK - 0.1 CY CONC.
4. CONSTRUCT:
   3" X 11.25° VERT. BEND, M.J. - 1 EA
   3" RETAINER GLAND - 2 EA
   CONC. GRAVITY BLOCK - 0.8 CY CONC.
5. CONSTRUCT:
   3" X 11.25° VERT. BEND, M.J. - 1 EA
   3" RETAINER GLAND - 2 EA
   CONC. THRUST BLOCK - 0.1 CY CONC.
6. CONSTRUCT SANITARY SEWER LIFT STATION (SEE MANUFACTURER'S SHOP DRAWING ON SHEET 16)
   1 EA
7. CONSTRUCT 8" PVC (SDR 26) SANITARY SEWER LINE, STA. 15+90 - STA. 16+07
   17 LF
8. CONSTRUCT SANITARY SEWER MANHOLE (SEE DETAIL ON SHEET 10)
   1 EA
9. CONSTRUCT BOLLARDS (SEE DETAIL SHEET 13)
   7 EA



PROFESSIONAL CIVIL ENGINEER
FRANK J. DOLAND
E-7854
STATE OF NEBRASKA

NO.	REVISIONS	DATE

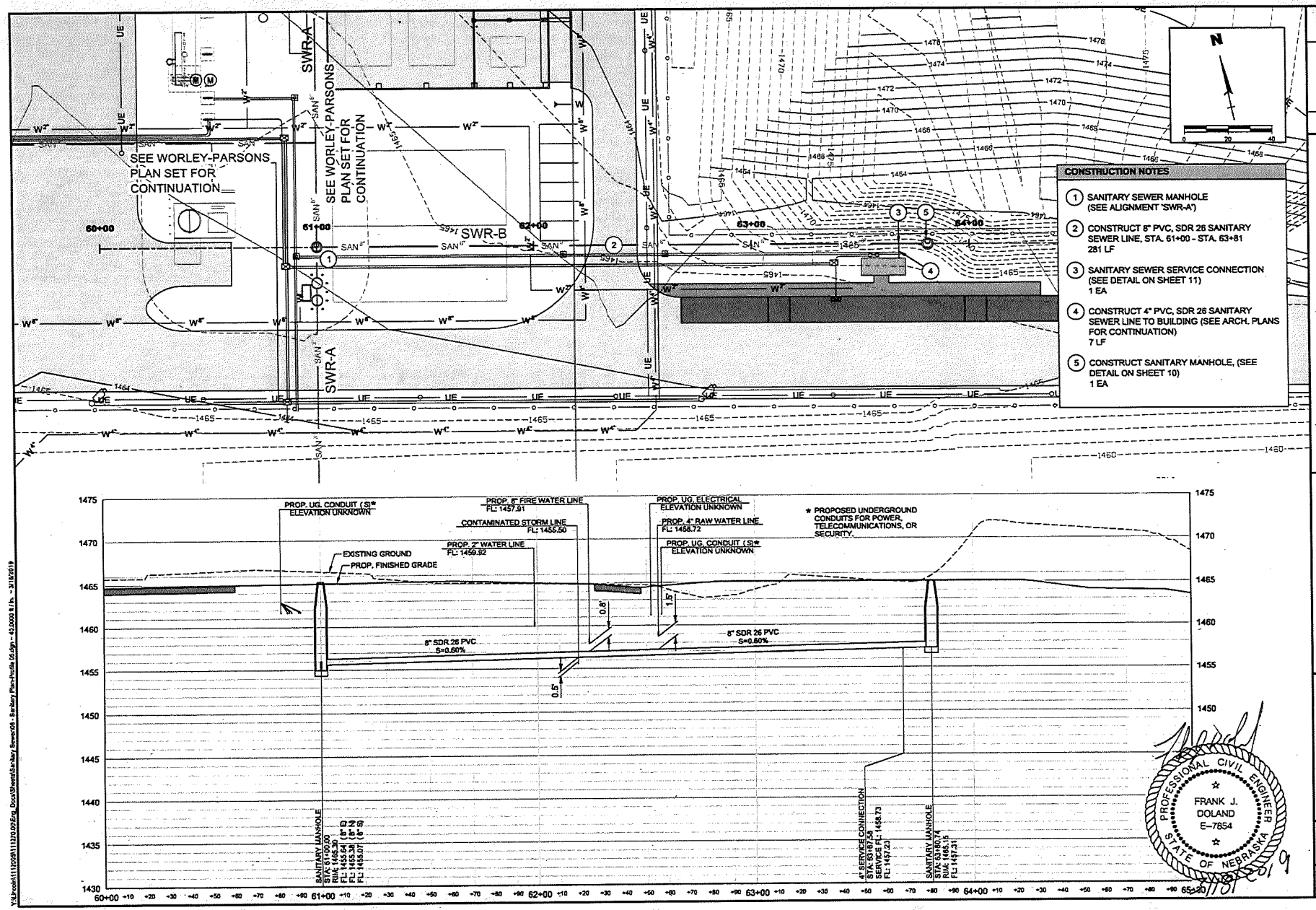
SANITARY SEWER LINE PLAN-PROFILE (SWR-A)

MONOLITH
SANITARY SEWER
HALLAM, NEBRASKA

benesch
Alfred Benesch & Company
330 S. 10th Street, Suite 200
Lincoln, Nebraska 68508
402-479-2200

PROJECT: 111278.00
DATE: 3/18/2019
SHEET: 7 OF 16

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SANITARY SEWER PLAN-PROFILE (SWR-B)

MONOLITH

SANITARY SEWER
HALLAM, NEBRASKA

benesch
Alfred Benesch & Company
1141 N. Edgewood Suite 4
Lincoln, Nebraska 68508
402-479-2200
Job No. 111270.00

PROJECT 111270.00
DATE 3/18/2019
SHEET 8 OF 16

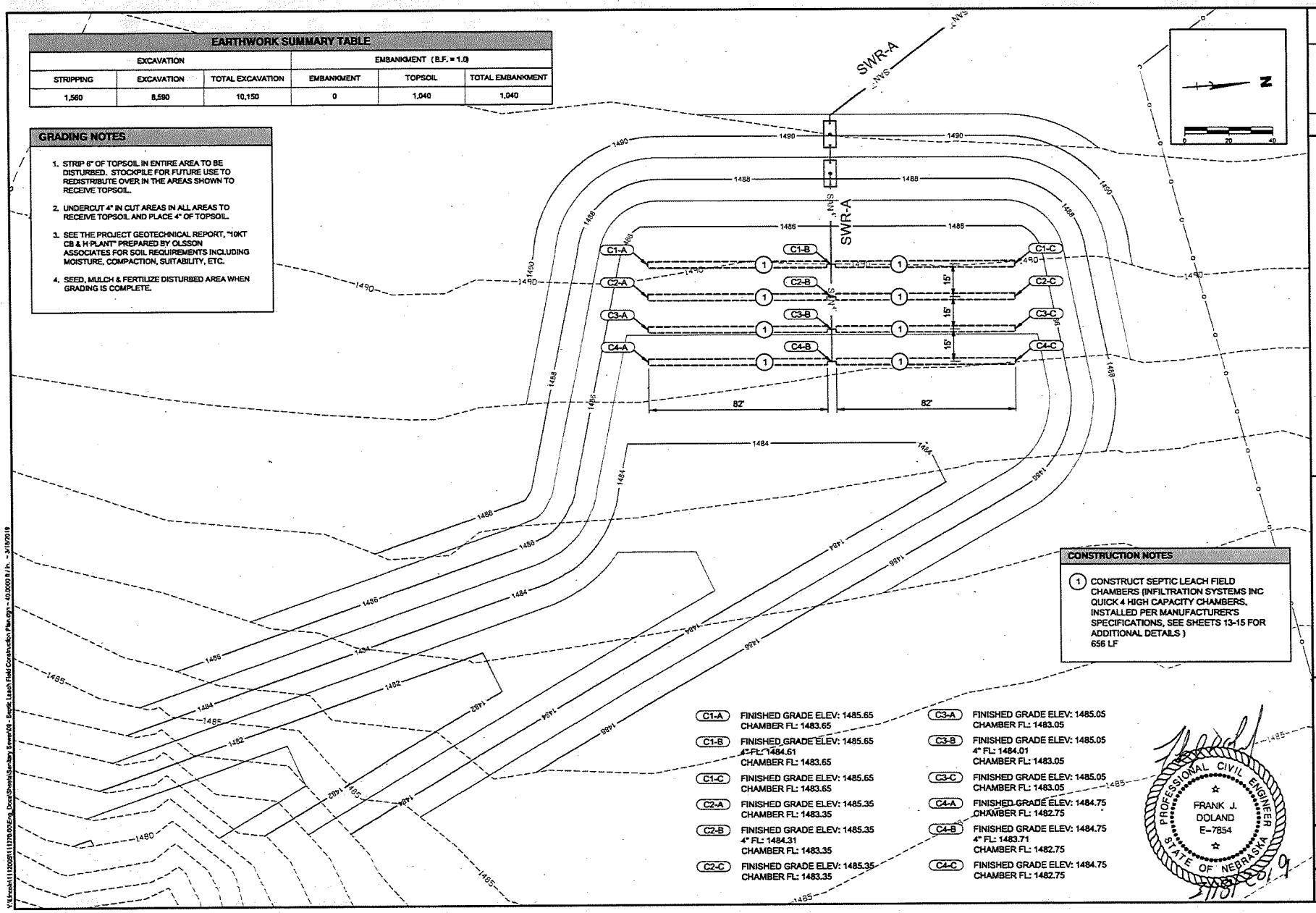
NO. REVISIONS DATE

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EARTHWORK SUMMARY TABLE					
EXCAVATION			EMBANKMENT (B.F. = 1.0)		
STRIPPING	EXCAVATION	TOTAL EXCAVATION	EMBANKMENT	TOPSOIL	TOTAL EMBANKMENT
1,560	8,590	10,150	0	1,040	1,040

GRADING NOTES

1. STRIP 6" OF TOPSOIL IN ENTIRE AREA TO BE DISTURBED. STOCKPILE FOR FUTURE USE TO REDISTRIBUTE OVER IN THE AREAS SHOWN TO RECEIVE TOPSOIL.
2. UNDERCUT 4" IN CUT AREAS IN ALL AREAS TO RECEIVE TOPSOIL AND PLACE 4" OF TOPSOIL.
3. SEE THE PROJECT GEOTECHNICAL REPORT, "10KT CB & H PLANT" PREPARED BY OLSSON ASSOCIATES FOR SOIL REQUIREMENTS INCLUDING MOISTURE, COMPACTION, SUITABILITY, ETC.
4. SEED, MULCH & FERTILIZE DISTURBED AREA WHEN GRADING IS COMPLETE.



CONSTRUCTION NOTES

(1) CONSTRUCT SEPTIC LEACH FIELD CHAMBERS (INFILTRATION SYSTEMS INC QUICK 4 HIGH CAPACITY CHAMBERS, INSTALLED PER MANUFACTURER'S SPECIFICATIONS, SEE SHEETS 13-15 FOR ADDITIONAL DETAILS)
656 LF

C1-A FINISHED GRADE ELEV: 1485.65
CHAMBER FL: 1483.65

C1-B FINISHED GRADE ELEV: 1485.65
4" FL: 1484.61
CHAMBER FL: 1483.65

C1-C FINISHED GRADE ELEV: 1485.65
CHAMBER FL: 1483.65

C2-A FINISHED GRADE ELEV: 1485.35
CHAMBER FL: 1483.35

C2-B FINISHED GRADE ELEV: 1485.35
4" FL: 1484.31
CHAMBER FL: 1483.35

C2-C FINISHED GRADE ELEV: 1485.35
CHAMBER FL: 1483.35

C3-A FINISHED GRADE ELEV: 1485.05
CHAMBER FL: 1483.05

C3-B FINISHED GRADE ELEV: 1485.05
4" FL: 1484.01
CHAMBER FL: 1483.05

C3-C FINISHED GRADE ELEV: 1485.05
CHAMBER FL: 1483.05

C4-A FINISHED GRADE ELEV: 1484.75
CHAMBER FL: 1482.75

C4-B FINISHED GRADE ELEV: 1484.75
4" FL: 1483.71
CHAMBER FL: 1482.75

C4-C FINISHED GRADE ELEV: 1484.75
CHAMBER FL: 1482.75

PROFESSIONAL CIVIL ENGINEER
FRANK J. DOLAND
E-7854
STATE OF NEBRASKA

NO.	REVISIONS	DATE

SEPTIC LEACH FIELD CONSTRUCTION PLAN

MONOLITH
SANITARY SEWER
HALLAM, NEBRASKA

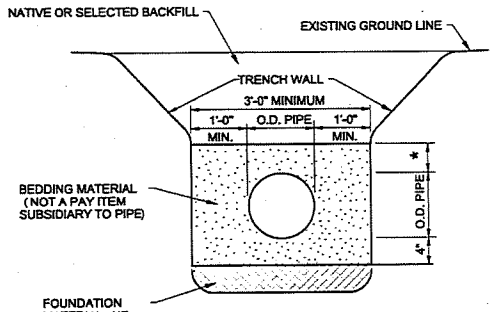
benesch
Alfred Benesch & Company
1100 Lincoln Mall, Suite 300
Lincoln, Nebraska 68508
402-479-2200

Job No. 111276.00

PROJECT 111276.00
DATE 3/18/2019
SHEET **9 OF 16**

Y:\Projects\111276.00\Engineering\Drawings\Sanitary Sewer\06 - Septic Leach Field Construction Plan.dgn - 40.0000 ft / in. - 3/19/2019

* 6" MIN. FOR ALL PRESSURE RATED FLEXIBLE PIPES (C900 OR C905) OR NON-PRESSURE RATED PIPES THAT ARE SDR 26 SCHEDULE 40 OR STRONGER. 18" ARE REQUIRED FOR NON-PRESSURE RATED FLEXIBLE PIPE LESS THAN SDR 26 SCHEDULE 40.

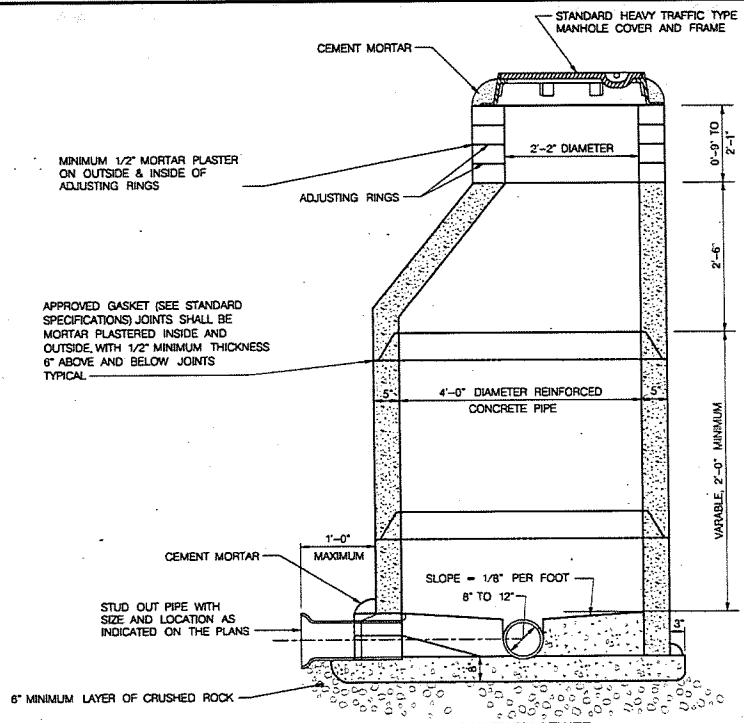


SANITARY SEWER
PIPE BEDDING DETAIL
NOT TO SCALE

PIPE BEDDING MATERIAL SPECIFICATIONS

BEDDING MATERIAL SHALL BE A WELL GRADED "CRUSHER RUN" CRUSHED ROCK OR CRUSHED CONCRETE WITH A PERCENT PASSING GRADATION RANGE AS FOLLOWS:

SIEVE SIZE	PERCENT PASSING
1"	100
#4	20-60
#10	0-30
#200	0-10



SANITARY SEWER
MANHOLE
NOT TO SCALE

GENERAL NOTES

MANHOLES SHALL BE CONSTRUCTED OF CONCRETE.

ALL MANHOLES ARE TO BE CONSTRUCTED CIRCULAR IN PLAN SIMILAR TO DRAWING.

CONCRETE IN MANHOLE SHALL BE NDOR 47B, VIBRATED IN PLACE.

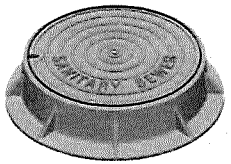
ADJUSTING RINGS SHALL BE FINISHED WITH ONE HALF INCH PLASTER COAT ON THE OUTSIDE & INSIDE COMPOSED OF CEMENT MORTAR, ONE PART PORTLAND CEMENT AND THREE PARTS SAND BY VOLUME.

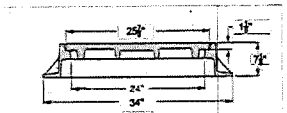
THE CAST IRON MANHOLE RING SHALL SET IN A BED OF MORTAR, AND CAREFULLY ADJUST TO PROPOSED GRADE.

MANHOLE FLOOR SHALL BE FINISHED TO A SMOOTH SURFACE.

PLACE VERTICAL SIDE OF TAPER SECTION FARTHEST FROM BACK OF CURB.

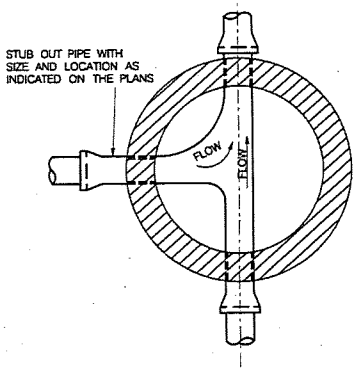
PIPE FITTINGS SHALL BE SOLVENT WELDED.



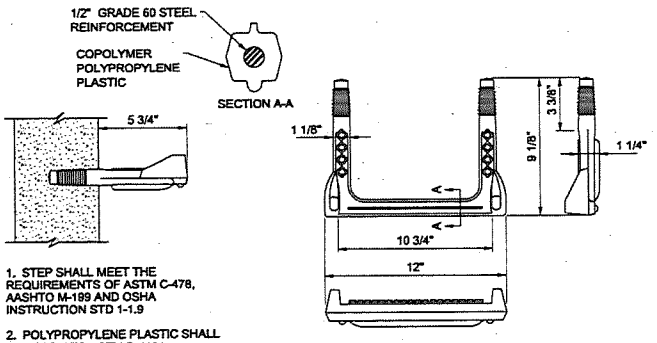


DEETER FOUNDRY HEAVY DUTY MANHOLE FRAME & SOLID LID, PRODUCT NO. R-1030 WITH "PROCESS WATER", OR APPROVED EQUAL.

PROCESS WATER MANHOLE
LID & FRAME DETAIL
NOT TO SCALE



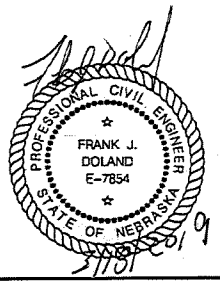
TYPICAL
MANHOLE INVERT
NOT TO SCALE



1. STEP SHALL MEET THE REQUIREMENTS OF ASTM C-478, AASHTO M-199 AND OSHA INSTRUCTION STD 1-1.9

2. POLYPROPYLENE PLASTIC SHALL CONFORM TO ASTM D-4101

REINFORCED
PLASTIC STEPS
NOT TO SCALE



NO.	REVISIONS	DATE

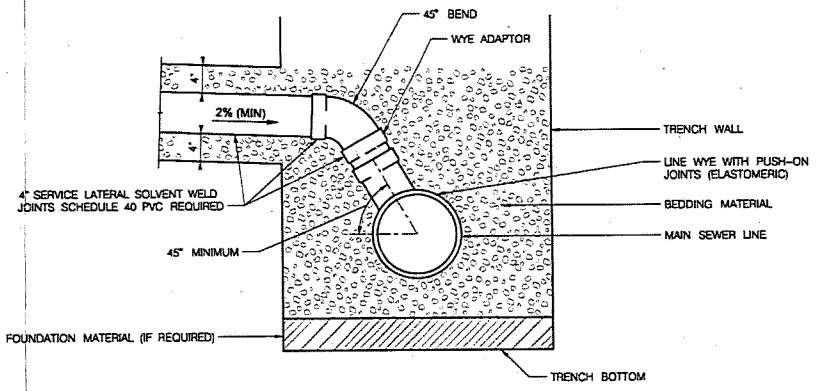
DETAILS

MONOLITH
SANITARY SEWER
HALLAM, NEBRASKA

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1200 Landmark Center, Suite 1200
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402-479-2200
Job No. 111270.00

PROJECT 111270.00
DATE 3/18/2019
SHEET 10 OF 16

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SANITARY SEWER SERVICE CONNECTION DETAIL

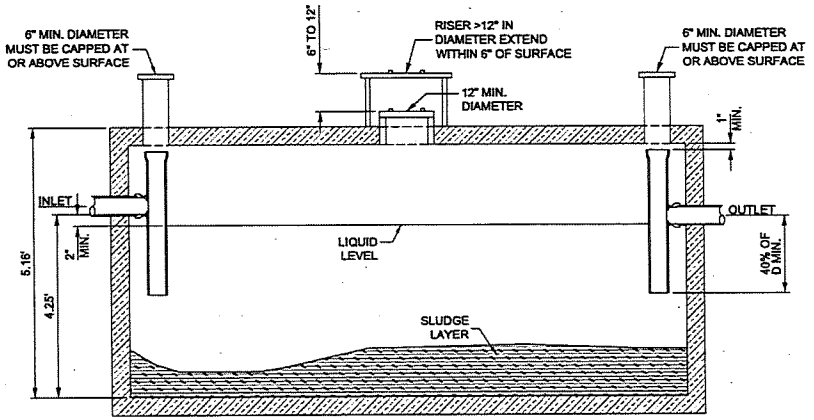
NOT TO SCALE

SEPTIC SERVICE CONNETION GENERAL NOTES

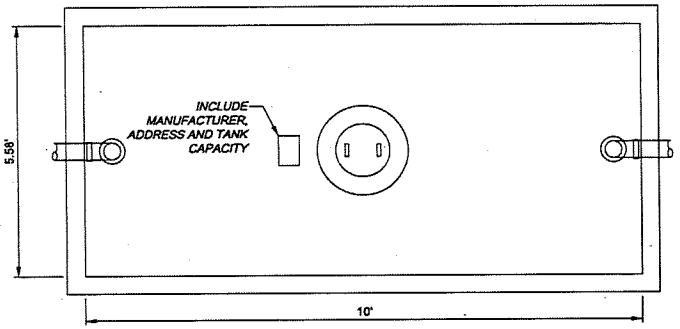
SERVICE WYE SHALL BE INSTALLED SO THAT SERVICE CONNECTION IS AT LEAST 45 DEGREES FROM HORIZONTAL

SERVICE LINE SHALL BE EXTENDED VERTICALLY AT PROPERTY LINE AND TERMINATED 5' BELOW FINISHED GRADE

SOLVENT WELDED CONNECTIONS ARE REQUIRED FOR THE ENTIRE SEWER SERVICE CONNECTION FROM LINE WYE TO THE CAP



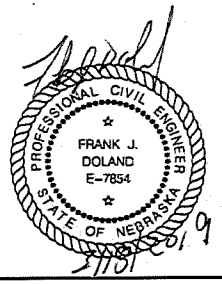
PROFILE VIEW



PLAN VIEW

SEPTIC TANK DETAILS

NOT TO SCALE



NO.	REVISIONS	DATE

DETAILS

MONOLITH

SANITARY SEWER
HALLAM, NEBRASKA

benesch
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1321 Jones Street, Suite 130
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402-479-2200

JOB No. 111270.00

PROJECT 111270.00

DATE 3/18/2019

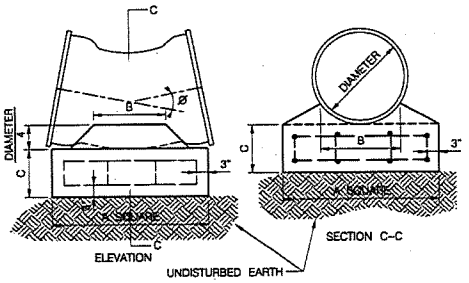
SHEET **11 OF 16**

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REINFORCED CONCRETE THRUST BLOCK

DIAMETER	Ø=11 1/4° A	B	C	BAR SIZE	NUMBER OF BARS EACH WAY	STEEL (LBS.)	CONCRETE CUBIC YARDS	DIAMETER	Ø=22 1/2° A	B	C	BAR SIZE	NUMBER OF BARS EACH WAY	STEEL (LBS.)	CONCRETE C.Y.
6	1'-3"	0'-9"	1'-0"	–	–	–	0.1	6	1'-6"	0'-9"	1'-0"	–	–	–	0.1
8	1'-6"	1'-0"	1'-0"	–	–	–	0.1	8	1'-6"	1'-0"	1'-0"	–	–	–	0.1
12	1'-6"	1'-0"	1'-0"	NO 4	3	4.0	0.1	12	2'-3"	1'-0"	1'-0"	NO 4	3	7.0	0.2
16	2'-3"	1'-0"	1'-0"	NO 4	3	7.0	0.2	16	3'-0"	1'-0"	1'-0"	NO 4	5	16.7	0.4
20	2'-9"	1'-3"	1'-0"	NO 4	4	12.0	0.4	20	3'-9"	1'-3"	1'-0"	NO 4	7	30.4	0.6
24	3'-3"	1'-6"	1'-0"	NO 4	6	22.0	0.5	24	4'-6"	1'-6"	1'-3"	NO 5	6	50.1	1.1
30	4'-0"	2'-0"	1'-3"	NO 4	7	32.7	0.9	30	5'-6"	2'-0"	1'-6"	NO 5	9	93.9	1.9
36	4'-9"	2'-6"	1'-3"	NO 5	7	62.0	1.3	36	6'-9"	2'-6"	1'-9"	NO 5	12	169.5	3.3
48	6'-6"	3'-3"	1'-6"	NO 5	13	162.7	1.9	48	9'-0"	3'-3"	2'-0"	NO 10	6	438.9	6.7

DIAMETER	Ø=45° A	B	C	BAR SIZE	NUMBER OF BARS EACH WAY	STEEL (LBS.)	CONCRETE CUBIC YARDS	DIAMETER	Ø=90° A	B	C	BAR SIZE	NUMBER OF BARS EACH WAY	STEEL (LBS.)	CONCRETE CUBIC YARDS
6	1'-9"	1'-0"	1'-0"	–	–	–	0.2	6	2'-3"	1'-0"	1'-0"	–	–	–	0.2
8	2'-3"	1'-0"	1'-0"	–	–	–	0.2	8	3'-0"	1'-0"	1'-0"	–	–	–	0.4
12	3'-3"	1'-0"	1'-0"	NO 4	6	22.0	0.4	12	4'-3"	1'-0"	1'-3"	NO 5	6	47.0	0.9
16	4'-3"	1'-0"	1'-3"	NO 5	6	46.9	0.9	16	5'-9"	1'-0"	1'-6"	NO 5	10	109.5	2.0
20	5'-3"	1'-3"	1'-6"	NO 5	8	79.3	1.6	20	7'-0"	1'-3"	1'-9"	NO 5	15	203.4	3.3
24	6'-3"	1'-6"	1'-6"	NO 5	11	131.9	2.3	24	8'-6"	1'-6"	2'-0"	NO 6	15	360.5	5.6
30	7'-9"	2'-0"	1'-9"	NO 7	9	266.7	4.1	30	10'-6"	2'-0"	2'-3"	NO 9	10	680.0	9.5
36	9'-3"	2'-6"	2'-0"	NO 7	14	500.8	6.8	36	12'-6"	2'-6"	2'-9"	NO 10	11	1136.0	16.3
48	12'-3"	3'-3"	2'-6"	NO 10	11	1112.3	14.8	48	16'-9"	3'-3"	3'-6"	NO 11	16	2763.0	37.2

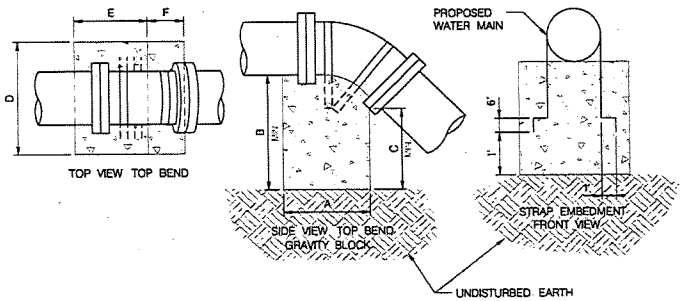


REINFORCED CONCRETE THRUST BLOCKS *

NOT TO SCALE

DOUBLE WRAP ALL JOINTS WITH POLYWRAP PRIOR TO PLACING CONCRETE BACKING BLOCKS.

COVER ALL STRAPS AND BEAMS OUTSIDE OF CONCRETE W/ POLYWRAP OR TAPE.



CONCRETE GRAVITY BLOCK

BEND	DIMENSION A	B MIN.	C MIN.	D	E	F	CONCRETE CY	STRAPS NO.	SIZE	EMBED.
16" x 45°	6'-0"	6'-0"	3'-0"	7'-0"	3'-0"	3'-0"	9.33	2	2" x 3/8"	30"
12" x 45°	6'-0"	5'-0"	2'-0"	5'-0"	3'-0"	3'-0"	4.72	2	2" x 1/4"	24"
8" x 45°	4'-0"	4'-0"	2'-0"	4'-6"	2'-0"	2'-0"	2.33	2	1" x 1/4"	18"
6" x 45°	3'-6"	3'-0"	1'-6"	3'-6"	2'-0"	1'-6"	1.43	2	1" x 1/4"	18"
16" x 22.5°	5'-6"	5'-6"	4'-6"	4'-6"	3'-0"	2'-6"	5.13	2	2" x 3/8"	30"
12" x 22.5°	4'-6"	5'-0"	4'-2"	3'-6"	2'-6"	2'-0"	2.88	2	2" x 1/4"	24"
8" x 22.5°	3'-0"	4'-0"	3'-6"	3'-0"	1'-6"	1'-6"	1.33	2	1" x 1/4"	18"
6" x 22.5°	2'-0"	3'-3"	3'-0"	3'-0"	1'-3"	0'-9"	0.72	2	1" x 1/4"	18"
16" x 11.25°	4'-0"	4'-0"	3'-6"	4'-0"	2'-0"	2'-0"	2.37	2	2" x 3/8"	30"
12" x 11.25°	3'-0"	3'-0"	2'-9"	3'-6"	2'-0"	1'-0"	1.17	2	2" x 1/4"	24"
8" x 11.25°	3'-0"	2'-0"	1'-9"	3'-0"	2'-0"	1'-0"	0.56	2	1" x 1/4"	18"
6" x 11.25°	2'-0"	2'-0"	1'-9"	2'-8"	1'-0"	1'-0"	0.40	2	1" x 1/4"	18"

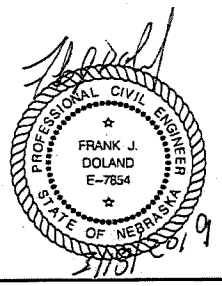
CONCRETE GRAVITY BLOCKS *

NOT TO SCALE

THRUST & RESTRAINT BLOCK GENERAL NOTES

1. ALL REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO A.S.T.M. SERIAL DESIGNATION A-305-507 AND SHALL SATISFY THE BEND TEST REQUIREMENTS FOR STRUCTURAL GRADE STEEL IN ACCORDANCE WITH THE REQUIREMENTS.
2. ALL CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3500 PSI.
3. ALL CONCRETE COLLARS SHALL BE CONSTRUCTED SUCH THAT THEY ARE ANCHORED AGAINST UNDISTURBED SOIL.
4. MINIMUM DEPTH OF EMBEDMENT FOR REINFORCING STEEL TO BE AS NOTED.
5. ALL REINFORCING STEEL SHALL BE EPOXY COATED.
6. POURED IN PLACE THRUST BLOCKING SHALL BE PROPERLY FORMED TO THE STATED DIMENSIONS AND SHALL NOT ENCASE THE M.J. BOLTS AND FASTENERS.
7. THRUST COLLARS FOR REDUCERS SHALL BE INSTALLED ON THE SMALL PIPE SIDE OF A REDUCER, HOWEVER THE SIZE SHALL BE BASED OFF OF THE LARGER DIAMETER PIPE.
8. GRAVITY BLOCK STRAPS OF THE SIZE AND TYPE SPECIFIED SHALL BE STATE STEEL TYPE M1020, OR EQUIVALENT, LOW CARBON, LOW MANGANESE, GENERAL PURPOSE, MERCHANT QUALITY STAINLESS STEEL THAT IS SUITABLE FOR FORMING AND WELDING.
9. ALL STRAP MATERIAL NOT EMBEDDED IN CONCRETE SHALL BE COVERED WITH POLYWRAP OR TAPE PRIOR TO BACKFILLING.

*** NOTE: PIPE SIZES SMALLER THAN 6" DIAMETER SHALL USE THRUST / GRAVITY / RESTRAINT BLOCK SIZES FOR A 6" DIAMETER PIPE.**



NO.	REVISIONS	DATE

DETAILS

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HALLAM, NEBRASKA

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Job No. 111278.00

PROJECT 111278.00

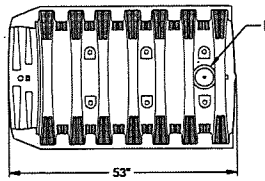
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SHEET **12 OF 16**

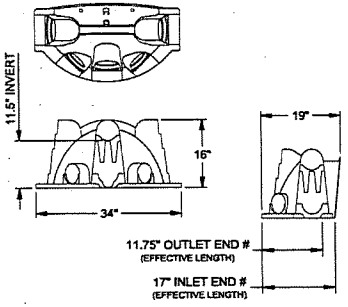
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ALL VIEWS = INSTALLED LENGTHS.

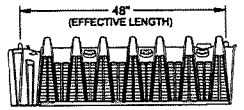
TOP VIEW



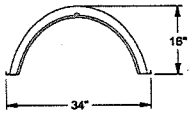
QUICK4 HIGH CAPACITY MULTIPORT END CAP



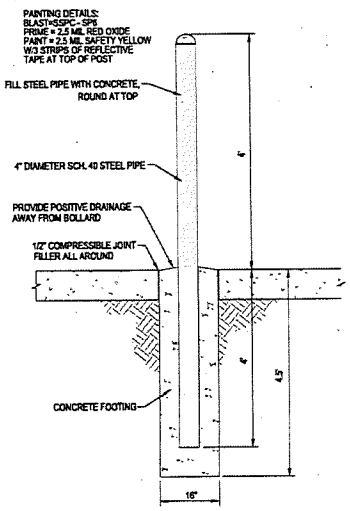
SIDE VIEW



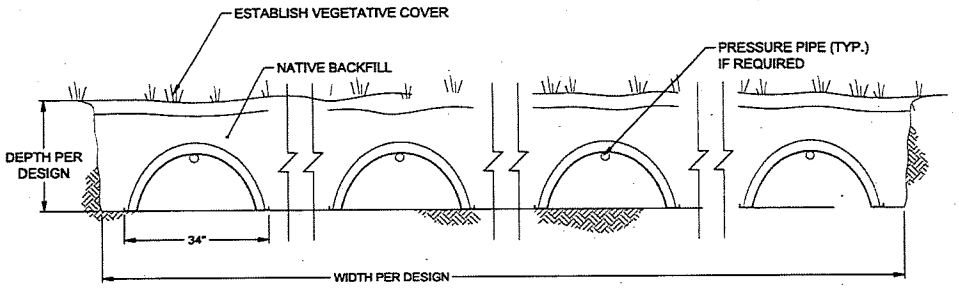
END VIEW



INFILTRATOR WATER TECHNOLOGIES
QUICK4 HIGH CAPACITY CHAMBER
PRODUCT SPECIFICATIONS
(NOT TO SCALE)

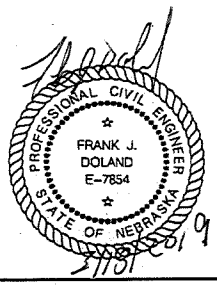


BOLLARD DETAIL
NOT TO SCALE



*SIZE OF SYSTEM DETERMINED BY DESIGN

INFILTRATOR WATER TECHNOLOGIES
QUICK4 HIGH CAPACITY CHAMBER
TYPICAL BED DETAIL
SECTION VIEW
(NOT TO SCALE)



NO.	REVISIONS	DATE

DETAILS

MONOLITH
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Alfred Benesch & Company
825 M Street, Suite 100
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402-479-2200 Job No. 111270.00

PROJECT 111270.00
DATE 3/13/2019
SHEET
13 OF 16

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Septic System Installation Instructions

INFILTRATOR® water technologies







Quick4® High Capacity Chambers
Quick4® Standard Chambers

Before You Begin

Quick4 High Capacity Chambers and Quick4 Standard Chambers may only be installed according to State and/or local regulations. If unsure of the installation requirements for a particular site, contact the local health department.

Like conventional systems, the soil and site conditions must be approved prior to installation. Conduct a thorough site evaluation to determine the proper sizing and siting of the system before installation.

Materials and Equipment Needed

- ❑ Quick4 Chambers
- ❑ MultiPort End Caps
- ❑ PVC Pipe and Couplings
- ❑ Backhoe
- ❑ Laser, Transit, or Level
- ❑ Shovel and Rake
- ❑ Tape Measure
- ❑ Utility Knife
- ❑ Hole Saw*
- ❑ 2-inch Drywall Screws*
- ❑ Screw Gun*
- ❑ Small Valve-Cover Box*
- ❑ 4-inch Cap for Inspection Port*

* Optional

These guidelines for construction machinery must be followed during installation:

- ❑ Avoid direct contact with chambers when using construction equipment. Chambers require a 12-inch minimum of compacted cover to support a wheel load rating of 16,000 lbs/axle or equivalent to an H-10 AASHTO load rating.
- ❑ Only drive across the trenches when necessary. Never drive down the length of the trenches.
- ❑ To avoid additional soil compaction, never drive heavy vehicles over the completed system.

Excavating and Preparing the Site

Note: As is the case with conventional systems, do not install the systems in wet conditions or in overly moist soils, as this causes machinery to smear the soil.

Note: The Quick4 Standard and Quick4 High Capacity chambers have a maximum cover depth of 48" for bed applications and 96" for trenches. Please refer to Infiltrator Cover Policy or call Infiltrator Water Technologies with any questions.

1. Stake out the location of all trenches and lines. Set the elevations of the tank, pipe, and trench bottom.

2. Install sedimentation and erosion control measures. Temporary drainage swales/berms may be installed to protect the site during rainfall events.

3. Excavate and level 3-foot wide trenches with proper center-to-center separation. Verify that the trenches are level or have the prescribed slope.

Note: Over excavate the trench width in areas where you are planning to contour.

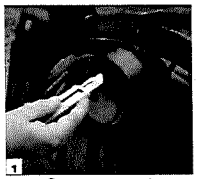
4. Rake the bottom and sides if smearing has occurred while excavating. Remove any large stones and other debris. Do not use the bucket teeth to rake the trench bottom.

Note: Raking to eliminate smearing is not necessary in sandy soils. In fine textured soils (silts and clays), avoid walking in the trench to prevent compaction and loss of soil structure.

5. Verify that each trench is level using a level, transit, or laser.

Preparing the End Cap

1. With a utility knife start the tear-out seal at the appropriate diameter for the inlet pipe. The seal allows for a tight fit for 3-inch, 4-inch SDR35, and 4-inch SCH40 pipe.



Start tear-out seal.

2. Pull the tab on the tear-out seal to create an opening on the end cap.

3. Snap off the molded splash plate located on the bottom front of the end cap.



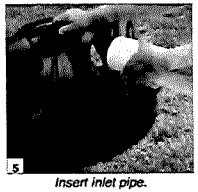
Pull tab on tear-out seal.

4. Install splash plate into the appropriate slots below the inlet to prevent trench bottom erosion.



Install splash plate.

5. Insert the inlet pipe into the end cap at the beginning of the trench. The pipe will go in several inches before reaching a stop. (Screws optional.)



Insert inlet pipe.

NO.	REVISIONS	DATE

MANUFACTURER'S DETAILS / SHOP DRAWINGS / CUT SHEETS

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SANITARY SEWER
HALLAM, NEBRASKA

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601 M Street, Suite 200
Lincoln, Nebraska 68508
402-479-2200 Job No. 111270.00

PROJECT 111270.00
DATE 3/18/2019
SHEET 14 OF 16

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Installing the System

1. Check the header pipe to be sure it is level or has the prescribed slope.

2. Set the invert height at 11.5 inches from the bottom of the trench for the Quick4 High Capacity Chamber. For the Quick4 Standard Chamber, set the invert height at 8 inches from the bottom of the trench.

3. Place the inlet end of the first chamber over the back edge of the end cap.

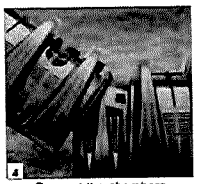


Place first chamber onto end cap.

4. Lift and place the end of the next chamber onto the previous chamber by holding it at a 90-degree angle. Line up the chamber end between the connector hook and locking pin at the top of the first chamber. Lower to the ground to connect the chambers.

Note: When the chamber end is placed between the connector hook and locking pin at a 90-degree angle, the pin will be visible from the back side of the chamber.

Note: The connector hook serves as a guide to ensure proper connection and does not add structural integrity to the chamber joint. Broken hooks will not affect the structure nor void the warranty.

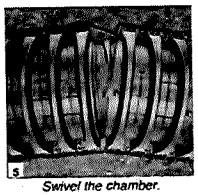


Connect the chambers.

5. Swivel the chamber on the pin to the proper direction for the trench layout.

Note: Quick4 Chambers allow for 10 degrees of swivel in either direction at each joint.

6. Where the system design requires straight runs, use the StraightLock™ Tabs to ensure straight connections. To activate the tabs, pop the tabs up with your thumb and lock into place.

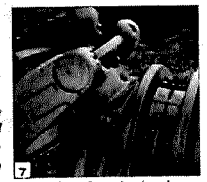


Swivel the chamber.

7. Continue connecting the chambers until the trench is completed.

Note: As the chambers are installed, verify they are level or have the prescribed slope.

8. The last chamber in the trench requires an end cap. Lift the end cap at a 45-degree angle and insert the connector hook through the opening on the top of the end cap. Applying firm pressure, lower the end cap to the ground to snap it into place. Do not remove the tear-out seal.



Attach end cap to chamber.

9. To ensure structural stability, fill the sidewall area by pulling soil from the sides of the trench with a shovel. Start at the joints where the chambers connect. Continue backfilling the entire sidewall area, making sure the fill covers the louvers.



Walking-in the fill.

10. Pack down the fill by walking along the edges of the trench and chambers. This is an important step in assuring structural support.

Note: In wet or clay soils, do not walk in the sidewalls.

11. Proceed to the next trench and begin with Step 1.

Installing Optional Inspection Ports

1. With a hole saw drill the pre-marked area in the top of the chamber to create a 4-inch opening.

2. Set a cut piece of pipe of the appropriate length into the corresponding chamber's inspection port sleeve.

Note: The sleeve will accommodate a 4-inch SCH40 pipe.

3. Use two screws to fasten the pipe to the sleeve around the inspection port.

4. Attach a threaded cap or cleanout assembly onto the protruding pipe at the appropriate height.

5. A small valve cover box may be used if inspection port is below the desired grade.

Covering the System

Before backfilling, the system must be inspected by a health officer or other official as required by State and local codes. Create an as-built drawing at this time for future records.

1. Backfill the trench by pushing fill material over the chambers with a backhoe. Keep a minimum of 12 inches of compacted cover over the chambers before driving over the system.

Note: Do not drive over system while backfilling in sand.

Note: For shallow cover applications, you must mound 12 inches of soil over the system before driving over it, and then grade it back to 6 inches upon completion.

2. It is best to mound several inches of soil over the finish grade to allow for settling. This also ensures that runoff water is diverted away from the system.

3. After the system is covered, the site should be seeded or sodded to prevent erosion.

Note: If the system is for new home construction, it is important to leave marking stakes along the boundary of the system. This will show contractors where the site is located so they will not cross it with equipment or vehicles.

Infiltrator Water Technologies Limited Warranty

(a) The structural integrity of each chamber, end cap and other accessory manufactured by Infiltrator ("Units"), when installed and operated in a leachfield of an onsite septic system in accordance with Infiltrator's instructions, is warranted to the original purchaser ("Holder") against defective materials and workmanship for one year from the date that the septic permit is issued for the septic system containing the Units; provided, however, that if a septic permit is not required by applicable law, the warranty period will begin upon the date that installation of the septic system commences. To exercise its warranty rights, Holder must notify Infiltrator in writing at its Corporate Headquarters in Old Saybrook, Connecticut within fifteen (15) days of the alleged defect. Infiltrator will supply replacement Units for Units determined by Infiltrator to be covered by this Limited Warranty. Infiltrator's liability specifically excludes the cost of removal and/or installation of the Units.

(b) THE LIMITED WARRANTY AND REMEDIES IN SUBPARAGRAPH (a) ARE EXCLUSIVE. THERE ARE NO OTHER WARRANTIES WITH RESPECT TO THE UNITS, INCLUDING NO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

(c) This Limited Warranty shall be void if any part of the chamber system is manufactured by anyone other than Infiltrator. The Limited Warranty does not extend to incidental, consequential, special or indirect damages. Infiltrator shall not be liable for penalties or liquidated damages, including loss of production and profits, labor and materials, overhead costs, or other losses or expenses incurred by the Holder or any third party. Specifically excluded from Limited Warranty coverage are damage to the Units due to ordinary wear and tear, alteration, accident, misuse, abuse or neglect of the Units; the Units being subjected to vehicle traffic or other conditions which are not permitted by the installation instructions; failure to maintain the minimum ground covers set forth in the installation instructions; the placement of improper materials into the system containing the Units; failure of the Units or the septic system due to improper sizing or improper sizing, excessive water usage, improper grease disposal, or improper operation, or any other event not caused by Infiltrator. This Limited Warranty shall be void if the Holder fails to comply with all of the terms set forth in this Limited Warranty.

Further, in no event shall Infiltrator be responsible for any loss or damage to the Holder, the Units, or any third party resulting from installation or shipment, or from any product liability claims of Holder or any third party. For this Limited Warranty to apply, the Units must be installed in accordance with all site conditions required by State and local codes, all other applicable laws, and Infiltrator's installation instructions.

(d) No representative of Infiltrator has the authority to change or extend this Limited Warranty. No warranty applies to any party other than the original Holder.

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The above represents the standard Limited Warranty offered by Infiltrator. A limited number of States and counties have different warranty requirements. Any purchaser of Units should contact Infiltrator's Corporate Headquarters in Old Saybrook, Connecticut, prior to such purchase, to obtain a copy of the applicable warranty, and should carefully read that warranty prior to the purchase of Units.

For more information on the Quick4 Chambers, call **1-866-4QUICK4** or 1-866-478-4254.

Distributed By:

INFILTRATOR®
water technologies

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Old Saybrook, CT 06475
860-577-7000 • FAX 860-577-7001

U.S. Patents: 4,759,661; 5,017,041; 5,156,482; 5,336,017; 5,401,116; 5,511,903; 5,716,163; 5,588,778; 5,839,844
Canadian Patents: 1,329,959; 2,004,984 Other patents pending
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NO.	REVISIONS	DATE

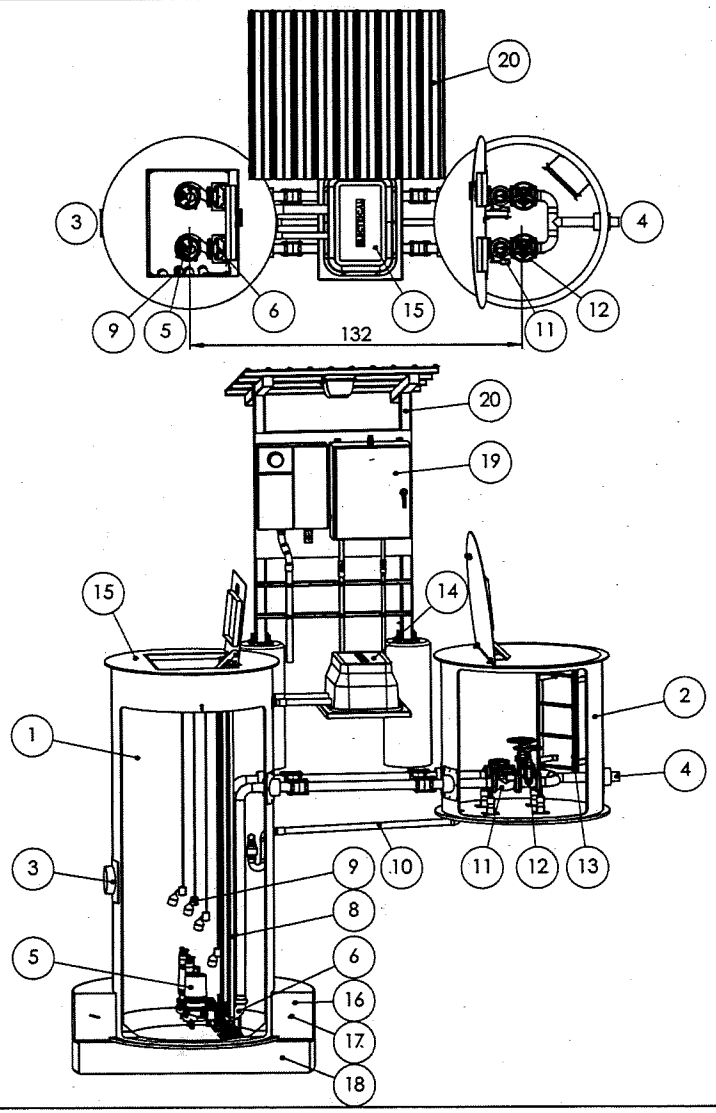
MANUFACTURER'S DETAILS / SHOP DRAWINGS / CUT SHEETS

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Job No. 111370.00

PROJECT 111370.00
DATE 3/18/2019
SHEET
15 OF 16

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NO.	ELEV.	DESCRIPTION
1		60 IN X 204 IN FRP WET WELL
	00.00	RIM
	-17.00	BASE
2		60 IN X 66 IN FRP VALVE VAULT
	-5.50	BASE
3	-11.80	IE - 12 IN INLET HUB FOR 8 IN PIPE
		9:00 POSITION
4	-4.20	CENTERLINE - 3 IN SCH 10 STAINLESS STEEL OUTLET
		3:00 POSITION
5		HYDROMATIC HPGFH750 GRINDER PUMPS, 7.5 HP,
		460V/3, NON-EXPLOSION-PROOF, 66 GPM @ 93 FT TDH
		SHIPPED LOOSE
6		3 IN MTM DISCHARGE ELBOW
7		3 IN SCH 10 STAINLESS STEEL DISCHARGE MANIFOLD
8		1-1/4 IN SCH 40 STAINLESS STEEL SLIDE RAILS
9		LEVEL TRANSDUCER AND LEVEL SWITCHES
	-12.10	HIGH LEVEL ALARM
	-12.60	LAG PUMP ON
	-13.10	LEAD PUMP ON
	-14.50	PUMP(S) OFF
10		2 IN SCH 40 PVC DRAIN
11		3 IN LEVER AND WEIGHT CHECK VALVE
12		3 IN RESILIENT SEAT GATE VALVE
13		LADDER
14		ELECTRICAL HAND HOLE JUNCTION BOX ASSEMBLY
		SHIPPED LOOSE
15		300 PSF ALUMINUM HATCHES
16		CONCRETE ANTI-FLOTATION RING - 24 IN WIDE X 12
		IN TALL - 2 YDS - BY OTHERS
17		#4 REBAR REINFORCEMENT - BY OTHERS
18		12 IN COMPACTED BASE - BY OTHERS
19		DUPLEX ALTERNATING CONTROL PANEL
		SHIPPED LOOSE
20		AFS 72 IN PANEL RACK (OPTIONAL)
		SHIPPED LOOSE REQUIRES CONCRETE BASES AND
		FIELD ASSEMBLY BY OTHERS

CUSTOMER APPROVAL: _____ DATE: _____

BY THIS SIGNATURE, CUSTOMER INDICATES THAT HE HAS REVIEWED THIS SUBMITTAL DRAWING AND FOUND THAT IT MEETS ALL OF THE DESIGNER'S FUNCTIONAL REQUIREMENTS AND/OR SPECIFICATIONS. CUSTOMER HEREBY AUTHORIZES RC WORST & CO. INC. TO MANUFACTURE THE CUSTOM PRODUCT IN ACCORDANCEWITH THIS SUBMITTAL DRAWING.

AFS STN 60 204 60 66 30 30 SS EXT
MONOLITH - SANITARY LS -005 - PROJECT #42625R1
PACKAGED LIFT STATION

SHEET 1 OF 1

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REVISIONS	2.1
DATE	1/10/19
SCALE	1:40
DRAWN BY	RJK
CHECKED BY	N/A

AFS
825 BEST AVE
COEUR D'ALENE, ID 83814
PHONE 208 664 2183
4444 S YELLOWSTONE HWY
IDAHO FALLS, ID 83402
208 529 8888
4101 E BROADWAY
SPOKANE, WA 99202
PHONE 509 534 9616
WWW.RCWORST.COM

MANUFACTURER'S DETAILS / SHOP DRAWINGS / CUT SHEETS

MONOLITH
SANITARY SEWER
HALLAM, NEBRASKA

NO.	REVISIONS	DATE

benesch
Alfred Benesch & Company
625 N 6 Street, Suite 100
Lincoln, Nebraska 68508
402-475-2200 Job No. 111270.00

PROJECT 111270.00
DATE 3/16/2015
SHEET 16 OF 16

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SHEET INDEX

COVER SHEET	1
PROJECT OVERVIEW	2
UTILITY OVERVIEW	3
SANITARY SEWER LINE PLAN-PROFILE	4-8
SEPTIC LEACH FIELD CONSTRUCTION PLAN	9
DETAILS	10-13
MANUFACTURER'S DETAILS / SHOP DRAWINGS / CUT SHEETS	15-16

MONOLITH

SANITARY SEWER PLANS AT THE MONOLITH 10KT CB & H PLANT

NEAR HALLAM, NEBRASKA

GENERAL NOTES

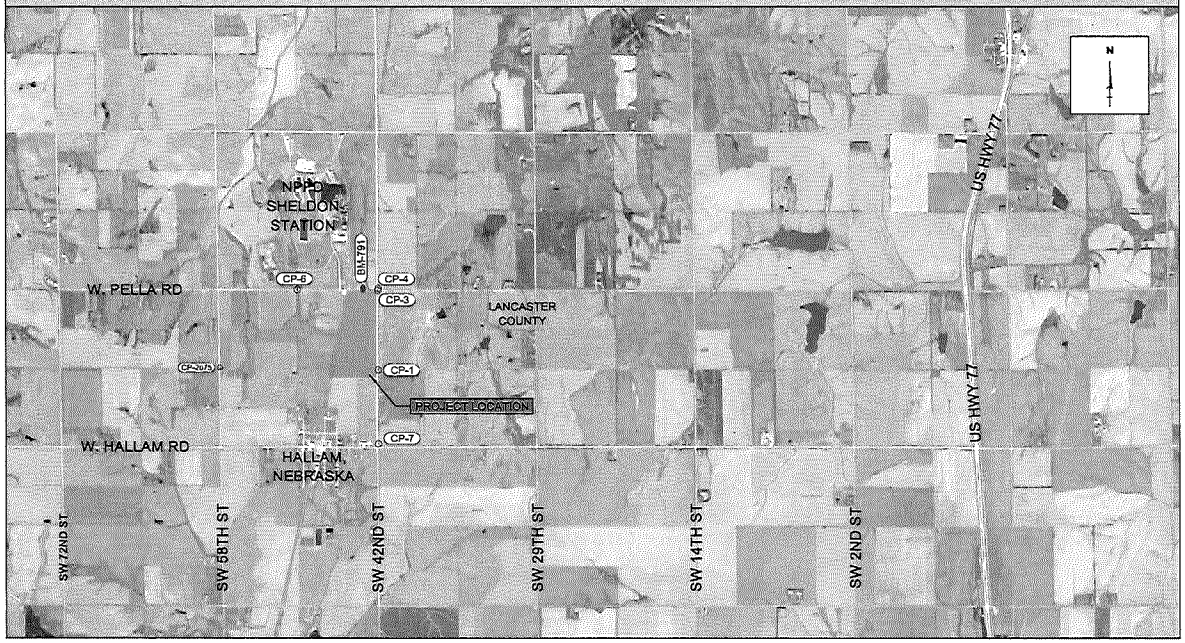
1. THE APPROXIMATE LOCATION OF KNOWN CABLES AND UTILITIES ARE INDICATED ON THE PLANS. ALL CABLES AND UTILITIES MAY NOT BE SHOWN. PRIOR TO BEGINNING ANY WORK ALL CONTRACTORS SHALL HAVE CONTACTED ONE CALL TO LOCATE TELEPHONE, GAS, WATER, SEWER, COMMUNICATION, LIGHTING LINES AND OTHER CABLES / UTILITES WITHIN THE CONSTRUCTION SITE.
2. EXISTING PAVEMENT, TURF, ROADS, CABLES, UTILITIES, AND INCIDENTALS THAT ARE DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED BY THE CONTRACTOR AT NO COST TO MONOLITH.
3. THE ITEMS IDENTIFIED IN THE SCHEDULE OF APPROXIMATE QUANTITIES ARE INTENDED TO IDENTIFY THE MAJOR WORK ITEMS. ALL ITEMS NOT SPECIFICALLY MENTIONED SHALL BE CONSIDERED SUBSIDIARY TO BID ITEMS TO WHICH THEY ARE RELATED AND WILL NOT BE CONSIDERED AS PAY ITEMS.
4. THE CONTRACTOR SHALL PRESERVE ALL SURVEY CONTROL. THE CONTRACTOR IS RESPONSIBLE FOR ALL STAKING ON THIS PROJECT.
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6. EXCAVATIONS THAT WILL BE OCCUPIED BY PERSONNEL SHALL BE MADE IN ACCORDANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) CONSTRUCTION STANDARD-29 CFR PART 1926, SUBPART P-EXCAVATIONS. OSHA STATES THAT A SOIL SHALL BE RECLASSIFIED IF THE PROPERTIES, FACTORS OR CONDITIONS AFFECTING THE SOIL'S CLASSIFICATION CHANGE IN ANY WAY. SHEET PILING AND/OR SHORING WILL BE NECESSARY IF THE SIDES OF THE EXCAVATION CANNOT BE SLOPED TO MEET OSHA REGULATIONS.

SURVEY CONTROL POINTS

POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP-1	107,388.012	138,519.935	1477.74	5/8" REBAR TIE
CP-3	110,045.836	138,505.948	1462.44	1" I.D. PIPE TIE
CP-4	110,111.658	138,523.104	1463.79	1" PCAP (ALLIED)
CP-6	110,069.502	135837.926	1398.88	3/4" REBAR TIE
CP-7	104,894.245	138,526.885	1485.70	NGS HALLAM 1947 NO. 2
CP-2675	107,470.655	133,276.180	1462.50	1" I.D. PIPE TIE
BM-791	110,112	138,007	1456.50	60D SPIKE

HORIZONTAL DATUM: LANCASTER COUNTY GRID
VERTICAL DATUM: NAVD88

VICINITY MAP



SCHEDULE OF APPROXIMATE QUANTITIES

ITEM DESCRIPTION	UNIT	QUANTITY
MOBILIZATION	LS	1
CONSTRUCTION STAKING	LS	1
EXCAVATION	CY	10150
TOPSOIL	CY	1040
3" PVC (SDR 21) R.J. SANITARY SEWER FORCE MAIN	LF	1199
4" PVC (SDR 26) SANITARY SEWER LINE	LF	112
8" PVC (SDR 26) SANITARY SEWER LINE	LF	298
3" x 11.25 DEG. BEND, M.J.	EA	2
3" x 22.5 DEG. BEND, M.J.	EA	2
3" x 45 DEG. BEND, M.J.	EA	2
3" RETAINER GLAND	EA	12
4" CROSS	EA	3
4" TEE	EA	1
SANITARY SEWER SERVICE CONNECTION	EA	1
SANITARY SEWER MANHOLE	EA	2
SANITARY SEWER LIFT STATION	EA	1
1,500 GALLON SEPTIC TANK	EA	2
SEPTIC LEACH FIELD CHAMBERS	LF	656
CONCRETE FOR THRUST / RESTRAINT BLOCKS	CY	2.2
BOLLARDS	EA	7
SEED, MULCH & FERTILIZE	AC	2

811call.com Nebraska811

PRIOR TO CONSTRUCTION:

CALL 1-800-331-5666 FOR LOCATION OF UNDERGROUND TELEPHONE, ELECTRIC, GAS MAINS, CABLE TELEVISION, WATER, SEWER OR ANY OTHER UTILITIES.

NOTE: EXISTING UNDERGROUND AND OVERHEAD UTILITIES AND DRAINAGE STRUCTURES HAVE BEEN PLOTTED FROM AVAILABLE INFORMATION AND THEREFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS THE RESPONSIBILITY OF THE INDIVIDUAL CONTRACTORS TO EXACTLY LOCATE AND PROTECT EACH EXISTING UTILITY BEFORE AND DURING ACTUAL CONSTRUCTION.

PROFESSIONAL CIVIL ENGINEER
FRANK J. DOLAND
E-7854
STATE OF NEBRASKA
3/18/19

NO.	REVISIONS	DATE

COVER SHEET

MONOLITH
SANITARY SEWER
HALLAM, NEBRASKA

benesch
Alfred Benesch & Company
625 M Street, Suite 100
Lincoln, Nebraska 68508
402.475.2000 LOA No. 11127000

PROJECT 11127000
DATE 3/18/2019
SHEET 1 OF 16

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MONOLITH

SANITARY SEWER PLANS AT THE MONOLITH 10KT CB & H PLANT

NEAR HALLAM, NEBRASKA

SHEET INDEX

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GENERAL NOTES

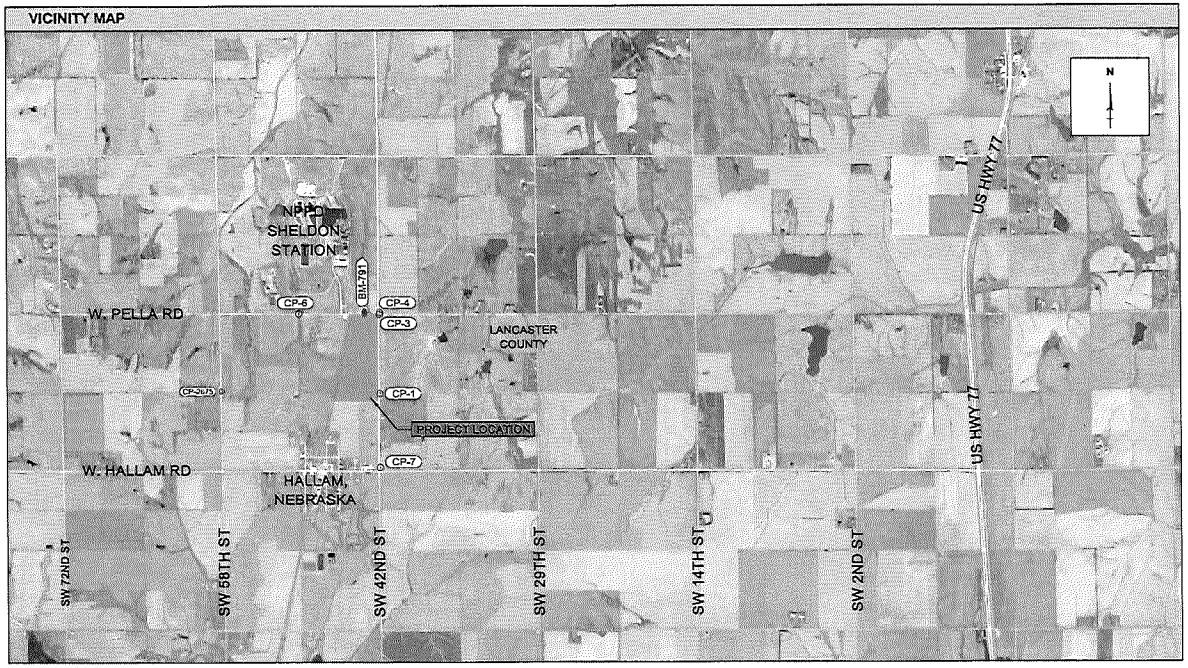
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HORIZONTAL DATUM: LANCASTER COUNTY GRID
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811.com
Nebraska811
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PROFESSIONAL CIVIL ENGINEER
FRANK J. DOLAND
E-7854
STATE OF NEBRASKA
3/15/19

NO.	REVISIONS	DATE

COVER SHEET

MONOLITH
SANITARY SEWER
HALLAM, NEBRASKA

benesch
Alfred Benesch & Company
232 N Street, Suite 102
Lincoln, NE 68508
402.477.7500
Job No. 111270.00

PROJECT 111270.00
DATE 3/18/2019
SHEET
1 OF 16

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DESIGN CALCULATION NOTES

LEACH FIELD DATA

AREA OF LATERALS IS SIZED BASED ON 103 FUTURE EMPLOYEES.

NONRESIDENTIAL WASTE WATER FLOW WAS DETERMINED IN COMPLIEANCE WITH THE "ONSITE WASTEWATER TREATMENT SYSTEMS MANUAL" FROM THE US DEPARTMENT OF ENVIRONMENTAL PROTECTION AGENCY. WE UTILILIZED TABLE 3-4 AND SELECTED THE TYPE OF FACILILTY AS "INDUSTRIAL (SANITARY WASTE ONLY) RANGE OF FLOWS, 7-16 GALLONS PER DAY. WE SELECTED THE CONSERVATIVE FLOW RATE OF 16 GALLONS PER DAY, PER EMPLOYEE, WHICH EQUATES TO 1,648 GALLONS PER DAY.

ABSORBTION TRENCH SIZING

REQUIRED AREA (SQ FT) = DESIGN FLOW (GPD) X 0.20 X PERCOLATION^0.5 IN / HR

1,879 SQ FT = 1648 GPD X 0.20 X (32.5 IN / HR) ^0.5

TRENCH

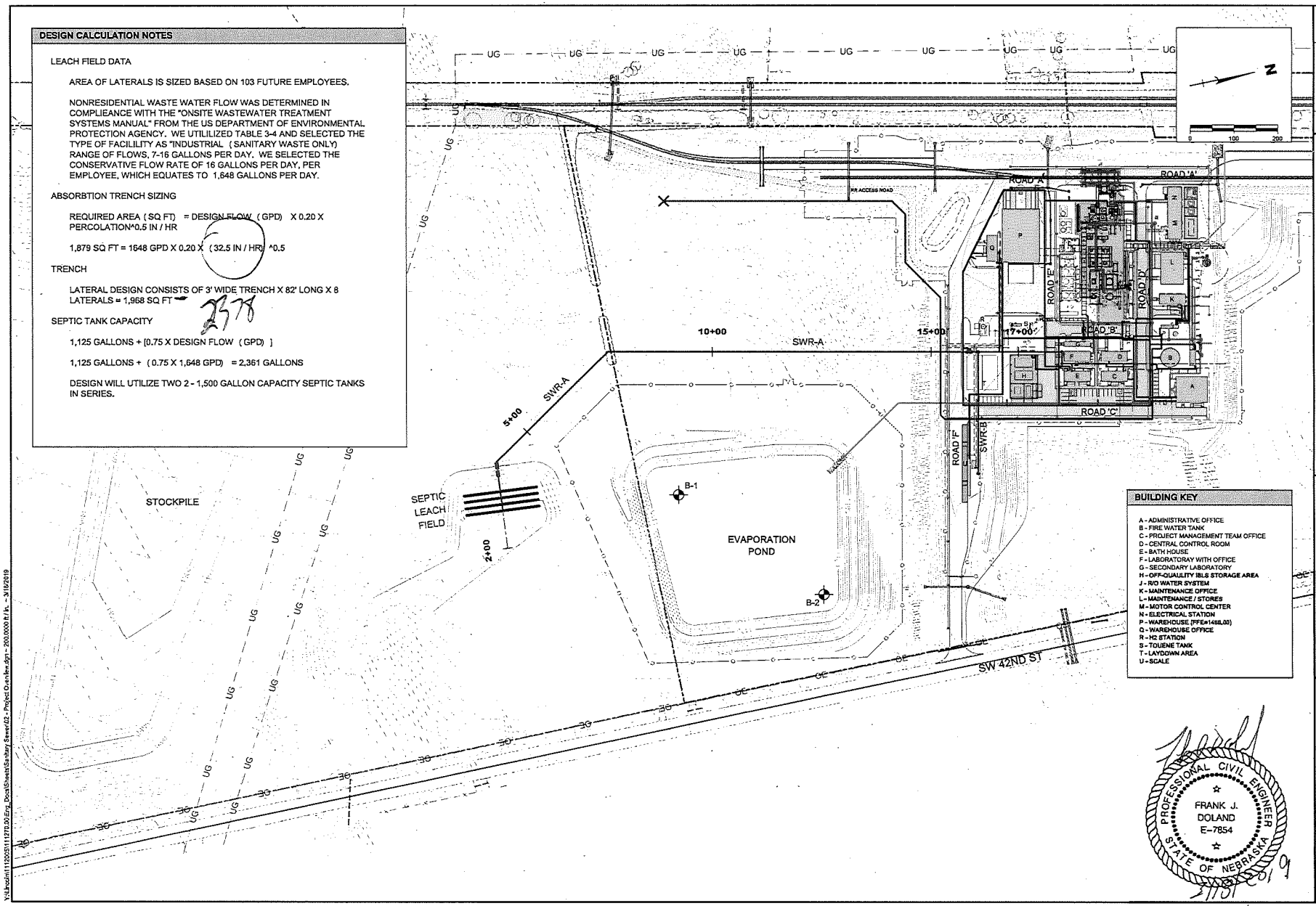
LATERAL DESIGN CONSISTS OF 3' WIDE TRENCH X 82' LONG X 8 LATERALS = 1,968 SQ FT

SEPTIC TANK CAPACITY

1,125 GALLONS + [0.75 X DESIGN FLOW (GPD)]

1,125 GALLONS + (0.75 X 1,648 GPD) = 2,361 GALLONS

DESIGN WILL UTILIZE TWO 2 - 1,500 GALLON CAPACITY SEPTIC TANKS IN SERIES.



BUILDING KEY

A - ADMINISTRATIVE OFFICE
B - FIRE WATER TANK
C - PROJECT MANAGEMENT TEAM OFFICE
D - CENTRAL CONTROL ROOM
E - BATH HOUSE
F - LABORATORAY WITH OFFICE
G - SECONDARY LABORATORY
H - OFF-QUALILITY IBLS STORAGE AREA
J - R/O WATER SYSTEM
K - MAINTENANCE OFFICE
L - MAINTENANCE / STORES
M - MOTOR CONTROL CENTER
N - ELECTRICAL STATION
P - WAREHOUSE (PFE=1468.00)
Q - WAREHOUSE OFFICE
R - H2 STATION
S - TOLUENE TANK
T - LAYDOWN AREA
U - SCALE

PROFESSIONAL CIVIL ENGINEER
FRANK J. DOLAND
E-7854
STATE OF NEBRASKA
3/18/19

NO.	REVISIONS	DATE

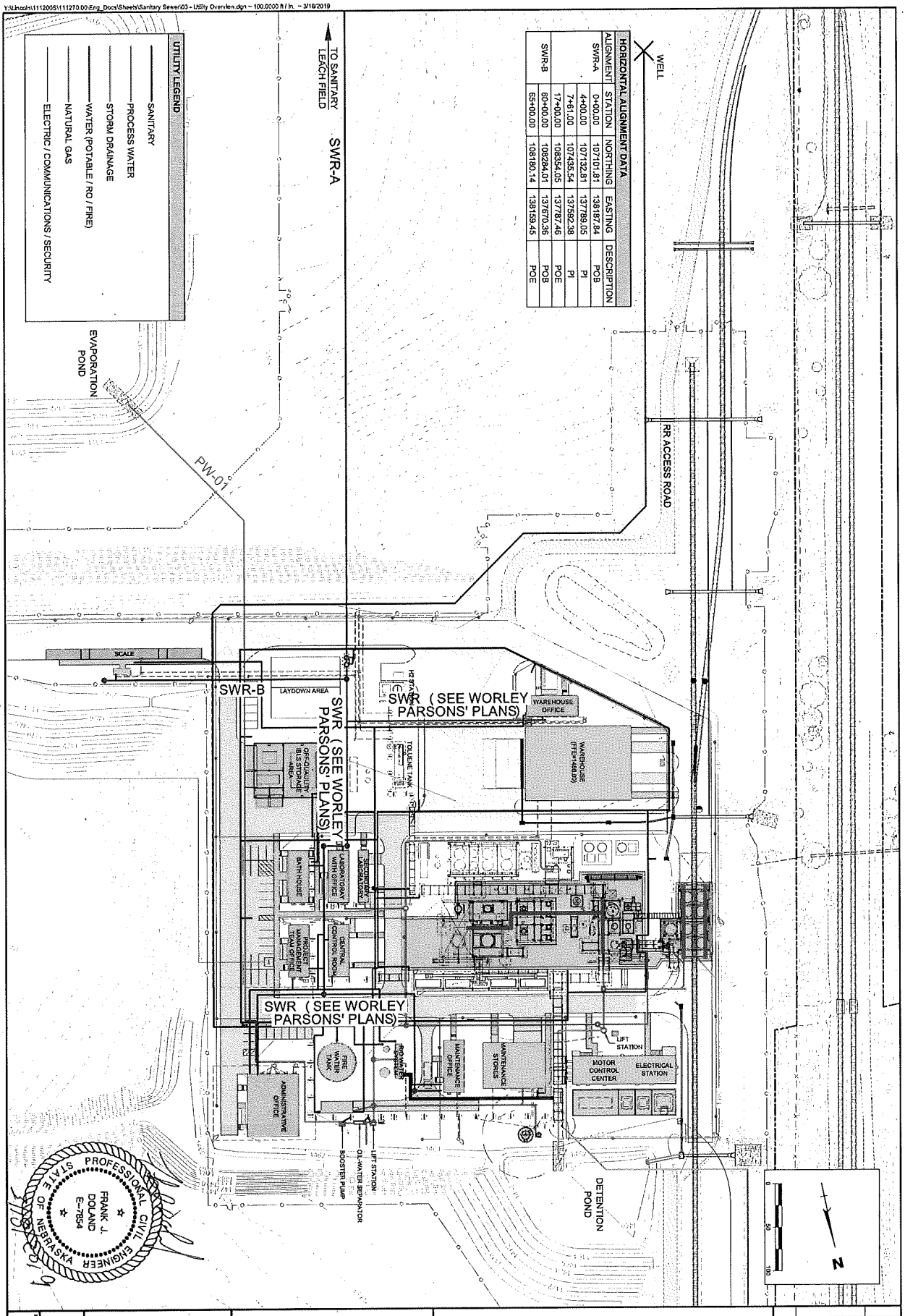
PROJECT OVERVIEW

MONOLITH
SANITARY SEWER
HALLAM, NEBRASKA

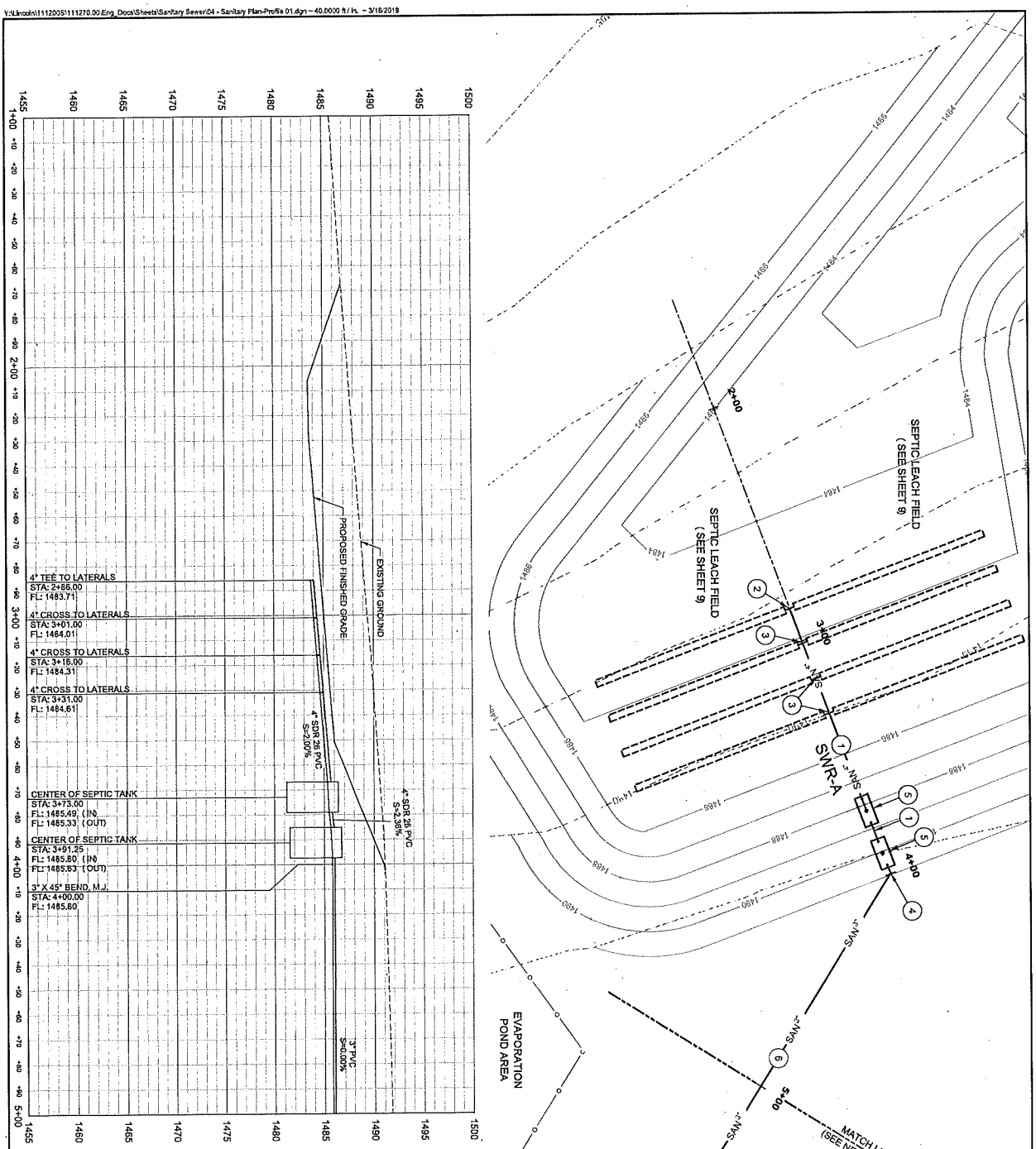
benesch
Alfred Benesch & Company
625 M Street, Suite 100
Lincoln, Nebraska 68508
402-475-2200 Job No. 111278.00

PROJECT 111278.00
DATE 3/18/2019
SHEET 2 OF 16

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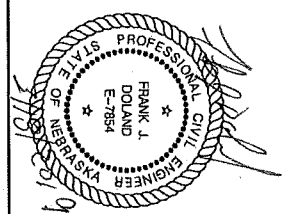

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UTILITY LEGEND
SANITARY
PROCESS WATER
STORM DRAINAGE
WATER (POTABLE / RO / FIRE)
NATURAL GAS
ELECTRIC / COMMUNICATIONS / SECURITY
TO SANITARY LEACH FIELD
SWR-A
EVAPORATION POND
PW-01
WELL
RR ACCESS ROAD
HORIZONTAL ALIGNMENT DATA
ALIGNMENT | STATION | NORTHING | EASTING | DESCRIPTION
SWR-A | 0+00.00 | 107101.81 | 138187.84 | POB
4+00.00 | 107132.81 | 137789.05 | PI
7+61.00 | 107435.54 | 137592.38 | PI
17+00.00 | 108334.05 | 137787.46 | POE
SWR-B | 60+00.00 | 108284.01 | 137670.36 | POB
65+00.00 | 108180.14 | 138159.45 | POE
SCALE
SWR-B
LAYDOWN AREA
SWR (SEE WORLEY PARSONS' PLANS)
WAREHOUSE OFFICE
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TOLUENE TANK
OFF-QUALITY SILS STORAGE AREA
BATH HOUSE
LABORATORY WITH OFFICE
LABORATORY
PROJECT MANAGEMENT TEAM OFFICE
CENTRAL CONTROL ROOM
SWR (SEE WORLEY PARSONS' PLANS)
WATER TANK
PROPANE TANK
MAINTENANCE OFFICE
MAINTENANCE STORES
LIFT STATION
MOTOR CONTROL CENTER
ELECTRICAL STATION
ADMINISTRATIVE OFFICE
BOOSTER PUMP
OIL-WATER SEPARATOR
LIFT STATION
DETENTION POND
N
FRANK J. DOLAND E-7854
STATE OF NEBRASKA PROFESSIONAL CIVIL ENGINEER
3 OF 16
benesch
Allied Benesch & Company
825 M Street, Suite 100
Lincoln, Nebraska 68508
402-479-2200
Job No. 111270.00
MONOLITH
SANITARY SEWER
HALLAM, NEBRASKA
UTILITY OVERVIEW
NO.
REVISIONS
DATE

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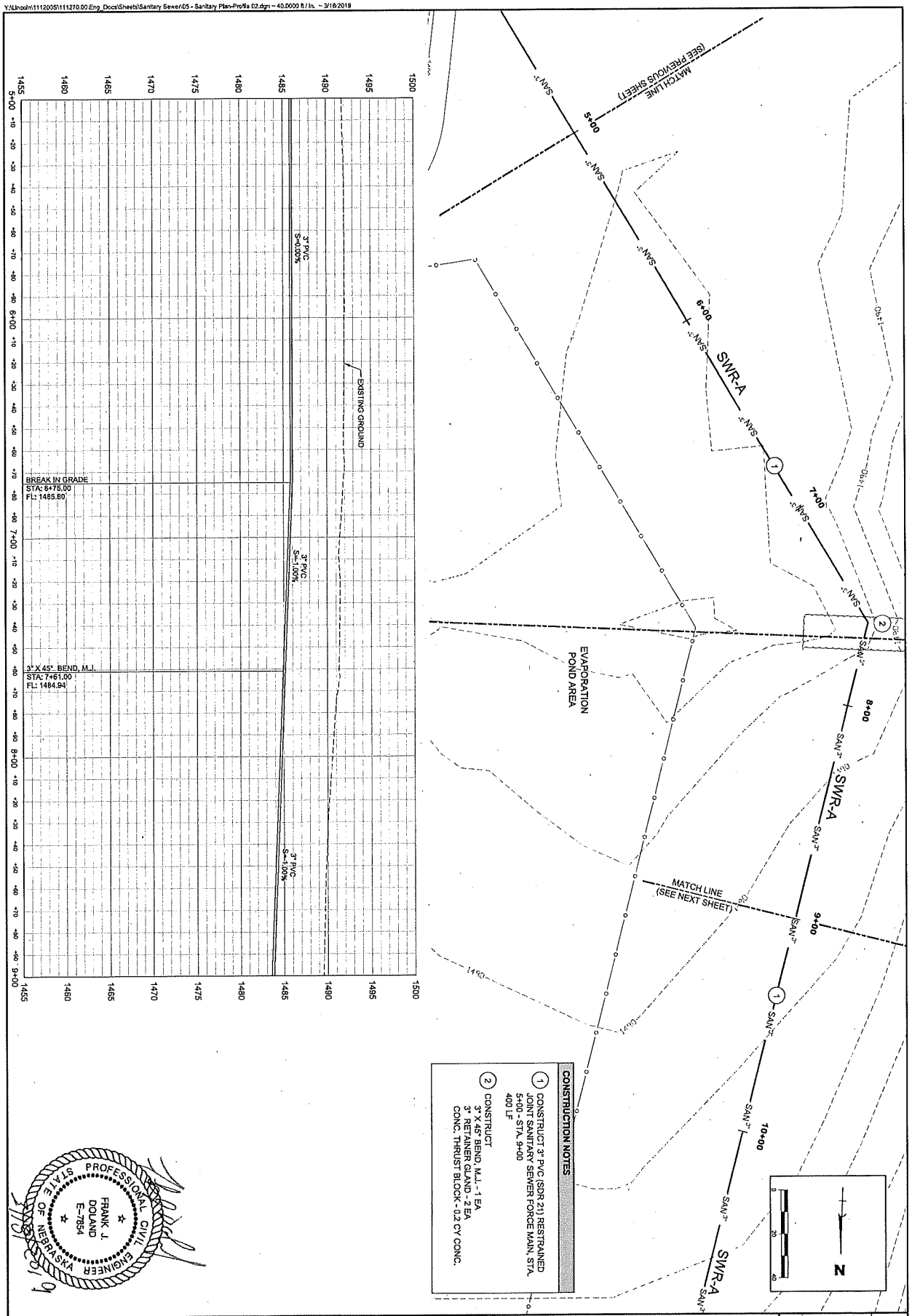
CONSTRUCTION NOTES

1. CONSTRUCT 4" PVC (SDR 26) SANITARY SEWER LINE, STA. 2+86 - STA. 3+91 105 LF
2. CONSTRUCT 4 " TEE 1 EA
3. CONSTRUCT 4" CROSS 3 EA
4. CONSTRUCT 3" X 45° BEND, M.J. - 1 EA 3" RETAINER GLAND - 2 EA CONC. THRUST BLOCK - 0.2 CY CONC.
5. CONSTRUCT 1,500 GALLON SEPTIC TANK (SEE DETAILS ON SHEET 11) 2 EA
6. CONSTRUCT 3" PVC (SDR 21) RESTRAINED JOINT SANITARY SEWER FORCE MAIN, STA. 3+91 - STA. 5+00 109 LF



SHEET 4 OF 16	benesch, Alfred Benesch & Company, 825 M Street, Suite 100, Lincoln, Nebraska 68508, 402-475-2200, Job No. 111270.00	**MONOLITH** **SANITARY SEWER** **HALLAM, NEBRASKA**	**SANITARY SEWER LINE** **PLAN-PROFILE** **(SWR-A)**

NO.	REVISIONS	DATE



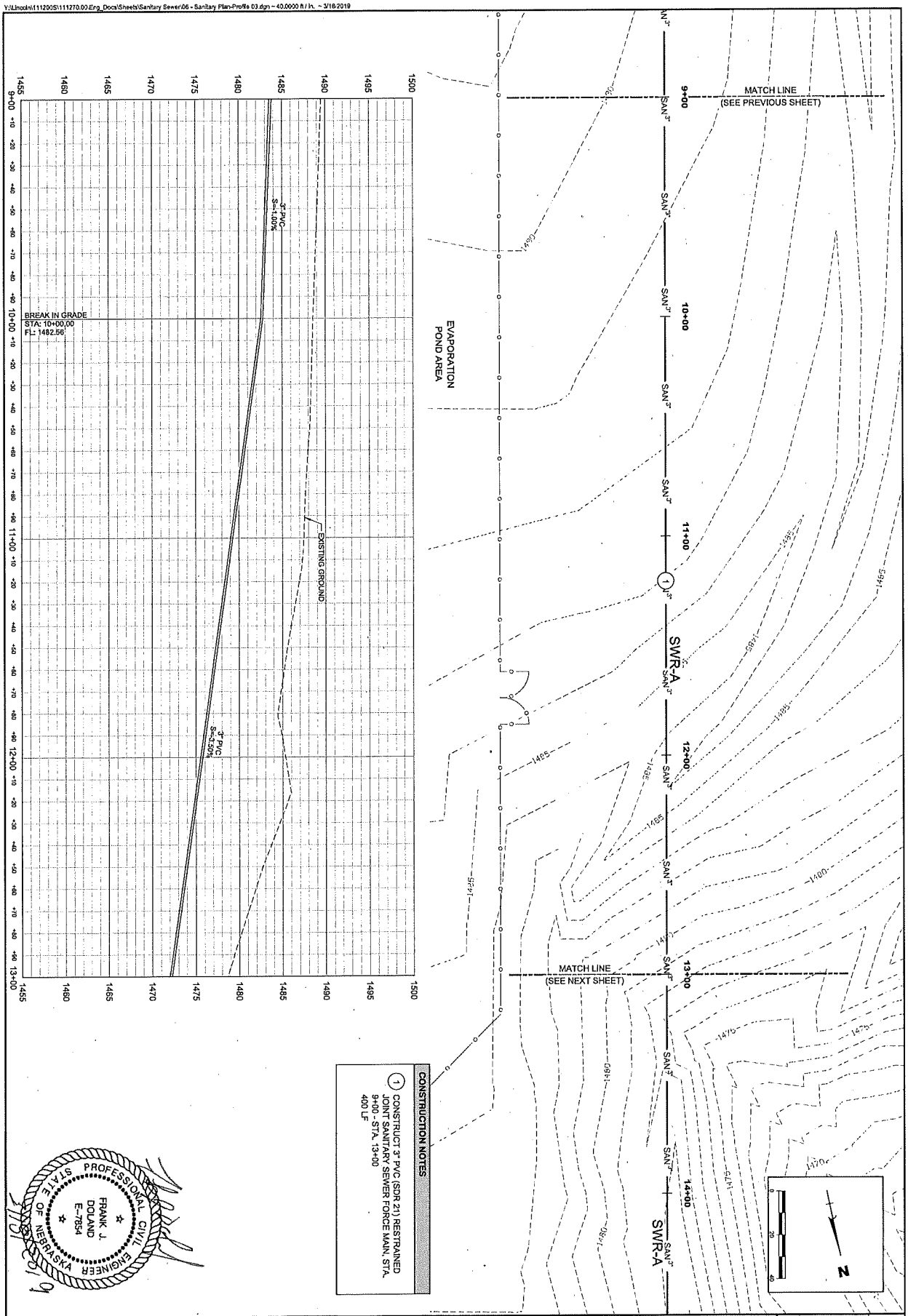
CONSTRUCTION NOTES

1. CONSTRUCT 3" PVC (SDR 21) RESTRAINED JOINT SANITARY SEWER FORCE MAIN, STA. 5+00 - STA. 9+00
   400 LF
2. CONSTRUCT
   3" X 45° BEND, M.J. - 1 EA
   3" RETAINER GLAND - 2 EA
   CONC. THRUST BLOCK - 0.2 CY CONC.

SHEET 5 OF 16	benesch Alfred Benesch & Company 825 M Street, Suite 100 Lincoln, Nebraska 68508 402-479-2200 Job No. 111270.00	**MONOLITH** **SANITARY SEWER** **HALLAM, NEBRASKA**	**SANITARY SEWER LINE** **PLAN-PROFILE** **(SWR-A)**

NO.	REVISIONS	DATE

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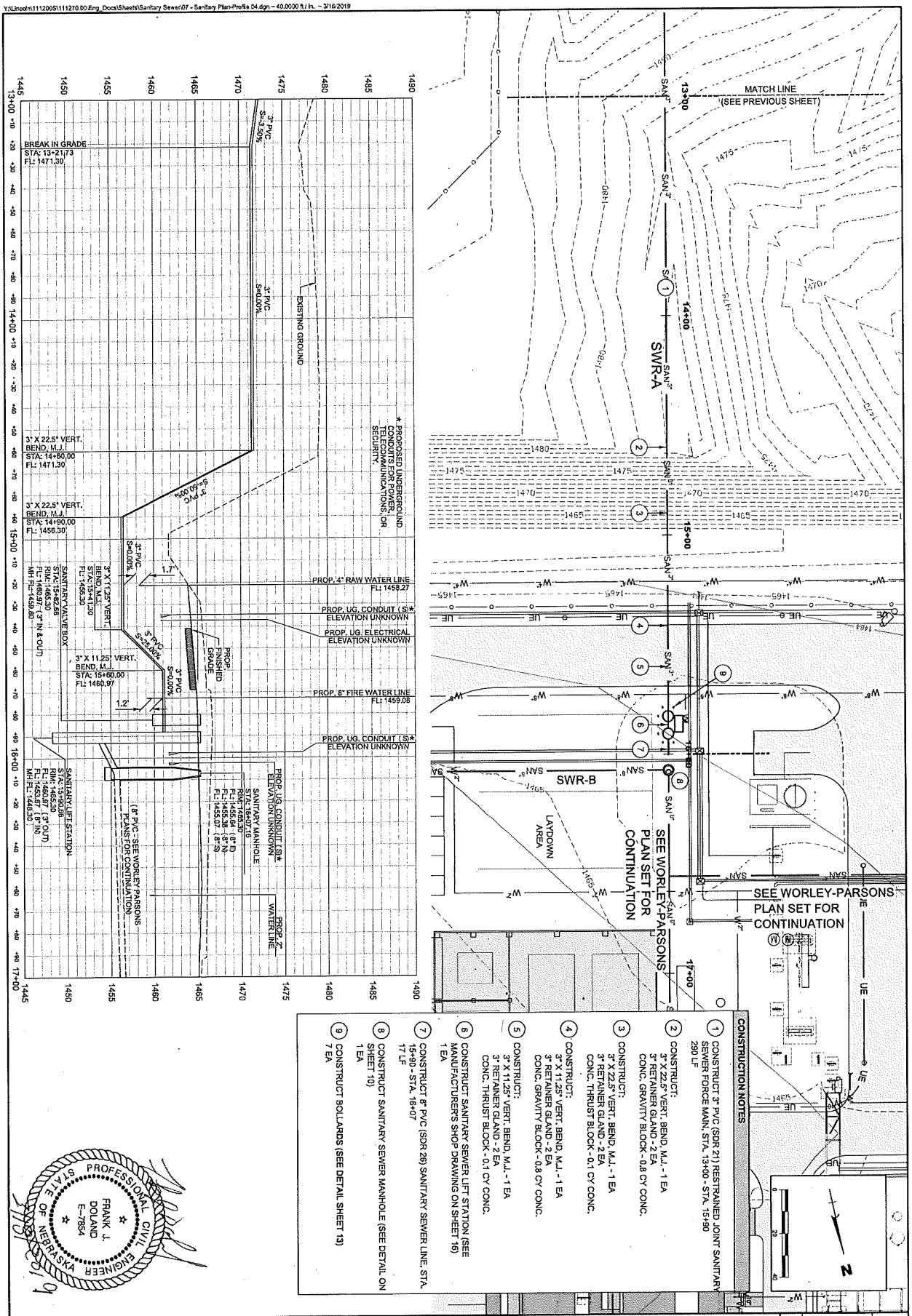


CONSTRUCTION NOTES

1. CONSTRUCT 3" PVC (SDR 21) RESTRAINED JOINT SANITARY SEWER FORCE MAIN, STA. 9+00 - STA. 13+00
   400 LF

SHEET 6 OF 16	benesch Alfred Benesch & Company 825 M Street, Suite 100 Lincoln, Nebraska 68508 402-479-2200 Job No. 111270.00	**MONOLITH** **SANITARY SEWER** **HALLAM, NEBRASKA**	**SANITARY SEWER LINE** **PLAN-PROFILE** **(SWR-A)**

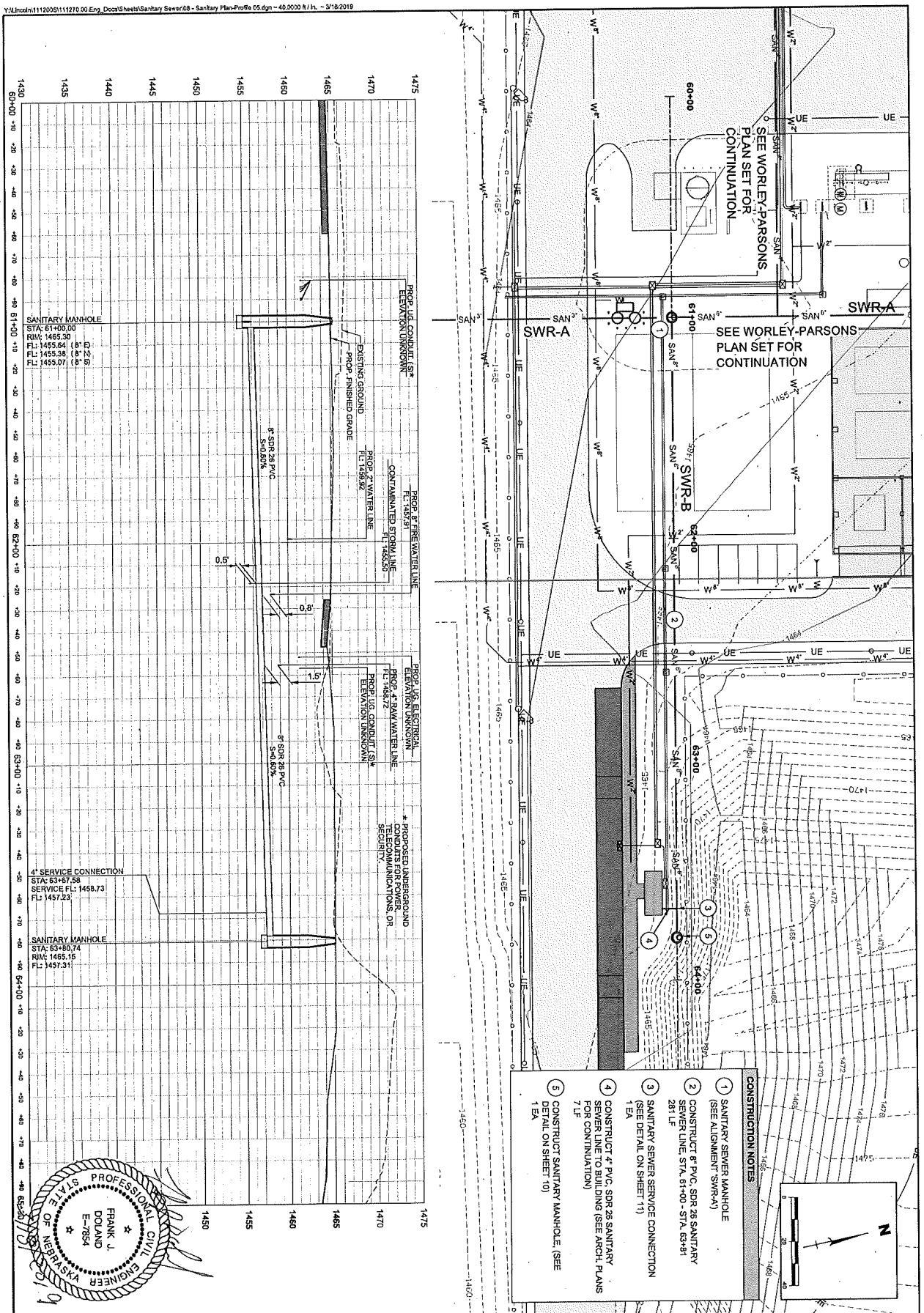
NO.	REVISIONS	DATE



PROFESSIONAL CIVIL ENGINEER STATE OF NEBRASKA
FRANK J. DOLAND
E-7854
3/19/19

benesch Alfred Benesch & Company 825 M Street, Suite 100 Lincoln, Nebraska 68508 402-475-2200 Job No. 111270.00	**MONOLITH** **SANITARY SEWER** **HALLAM, NEBRASKA**	**SANITARY SEWER LINE** **PLAN-PROFILE** **(SWR-A)**	NO. REVISIONS DATE

SHEET **7 OF 16**
PROJECT 111270.00
DATE 3/19/2019



PROFESSIONAL CIVIL ENGINEER
STATE OF NEBRASKA
FRANK J. DOLAND
E-7854

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402-479-2200 Job No. 111270.00

MONOLITH
SANITARY SEWER
HALLAM, NEBRASKA

SANITARY SEWER PLAN-PROFILE (SWR-B)

NO.	REVISIONS	DATE

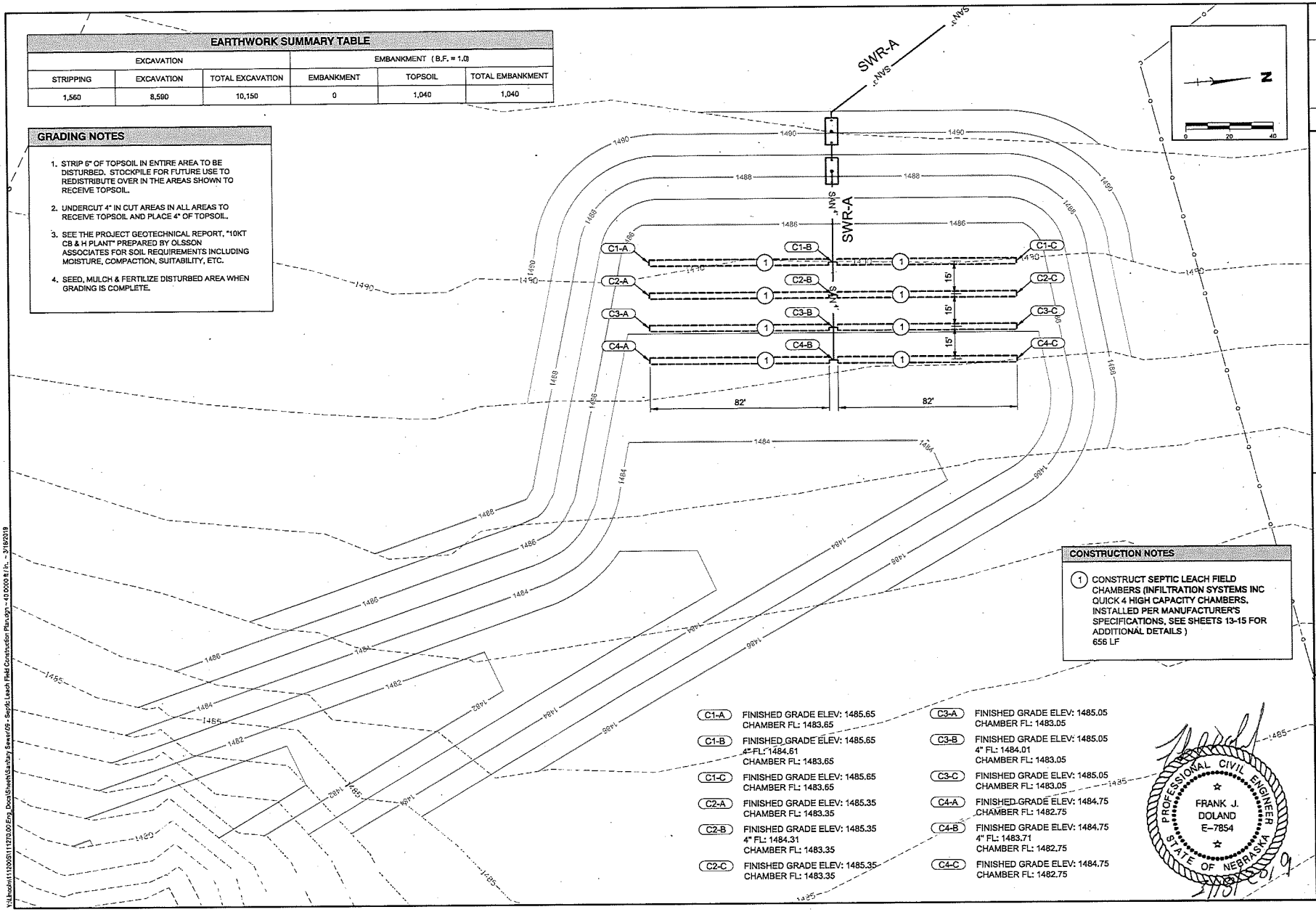
SHEET 8 OF 16
PROJECT 111270.00
DATE 3/18/2019

EARTHWORK SUMMARY TABLE

EXCAVATION			EMBANKMENT (B.F. = 1.0)		
STRIPPING	EXCAVATION	TOTAL EXCAVATION	EMBANKMENT	TOPSOIL	TOTAL EMBANKMENT
1,560	8,590	10,150	0	1,040	1,040

GRADING NOTES

1. STRIP 6" OF TOPSOIL IN ENTIRE AREA TO BE DISTURBED. STOCKPILE FOR FUTURE USE TO REDISTRIBUTE OVER IN THE AREAS SHOWN TO RECEIVE TOPSOIL.
2. UNDERCUT 4" IN CUT AREAS IN ALL AREAS TO RECEIVE TOPSOIL AND PLACE 4" OF TOPSOIL.
3. SEE THE PROJECT GEOTECHNICAL REPORT, "10KT CB & H PLANT" PREPARED BY OLSSON ASSOCIATES FOR SOIL REQUIREMENTS INCLUDING MOISTURE, COMPACTION, SUITABILITY, ETC.
4. SEED, MULCH & FERTILIZE DISTURBED AREA WHEN GRADING IS COMPLETE.



CONSTRUCTION NOTES

(1) CONSTRUCT SEPTIC LEACH FIELD CHAMBERS (INFILTRATION SYSTEMS INC QUICK 4 HIGH CAPACITY CHAMBERS, INSTALLED PER MANUFACTURER'S SPECIFICATIONS, SEE SHEETS 13-15 FOR ADDITIONAL DETAILS)
656 LF

C1-A	FINISHED GRADE ELEV: 1485.65 CHAMBER FL: 1483.65	C3-A	FINISHED GRADE ELEV: 1485.05 CHAMBER FL: 1483.05
C1-B	FINISHED GRADE ELEV: 1485.65 4" FL: 1484.61 CHAMBER FL: 1483.65	C3-B	FINISHED GRADE ELEV: 1485.05 4" FL: 1484.01 CHAMBER FL: 1483.05
C1-C	FINISHED GRADE ELEV: 1485.65 CHAMBER FL: 1483.65	C3-C	FINISHED GRADE ELEV: 1485.05 CHAMBER FL: 1483.05
C2-A	FINISHED GRADE ELEV: 1485.35 CHAMBER FL: 1483.35	C4-A	FINISHED GRADE ELEV: 1484.75 CHAMBER FL: 1482.75
C2-B	FINISHED GRADE ELEV: 1485.35 4" FL: 1484.31 CHAMBER FL: 1483.35	C4-B	FINISHED GRADE ELEV: 1484.75 4" FL: 1483.71 CHAMBER FL: 1482.75
C2-C	FINISHED GRADE ELEV: 1485.35 CHAMBER FL: 1483.35	C4-C	FINISHED GRADE ELEV: 1484.75 CHAMBER FL: 1482.75

PROFESSIONAL CIVIL ENGINEER
FRANK J. DOLAND
E-7854
STATE OF NEBRASKA

NO.	REVISIONS	DATE

SEPTIC LEACH FIELD CONSTRUCTION PLAN

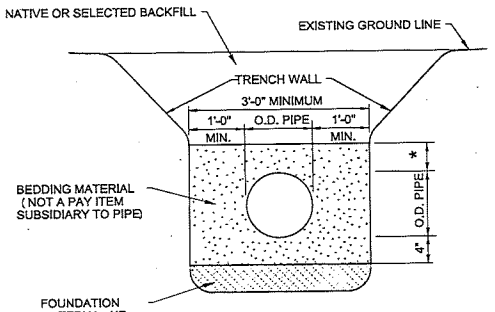
MONOLITH
SANITARY SEWER
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Job No. 11127800

PROJECT 11127800
DATE 3/18/2019
SHEET 9 OF 16

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* 6" MIN. FOR ALL PRESSURE RATED FLEXIBLE PIPES (C900 OR C905) OR NON-PRESSURE RATED PIPES THAT ARE SDR 26 SCHEDULE 40 OR STRONGER. 18" ARE REQUIRED FOR NON-PRESSURE RATED FLEXIBLE PIPE LESS THAN SDR 26 SCHEDULE 40.

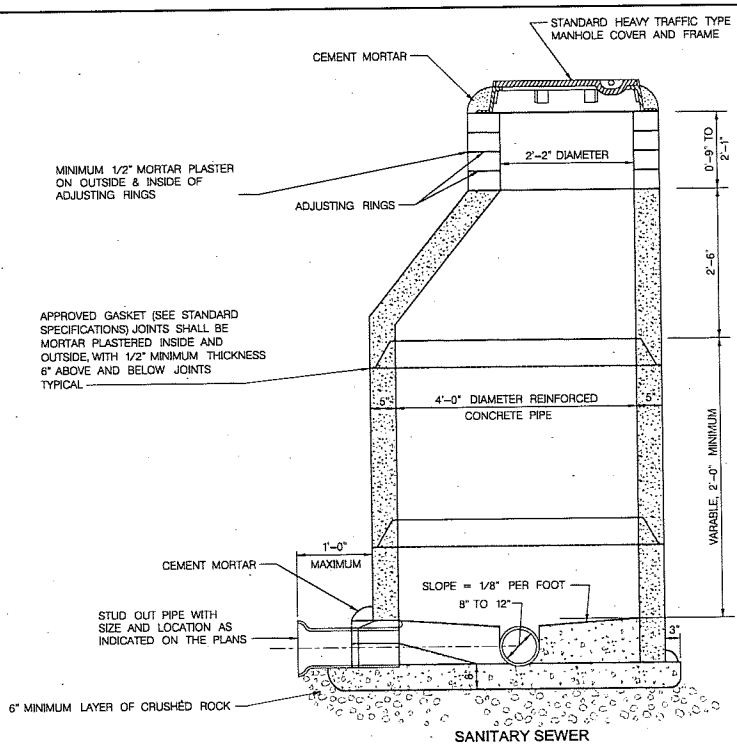


SANITARY SEWER
PIPE BEDDING DETAIL
NOT TO SCALE

PIPE BEDDING MATERIAL SPECIFICATIONS

BEDDING MATERIAL SHALL BE A WELL GRADED "CRUSHER RUN" CRUSHED ROCK OR CRUSHED CONCRETE WITH A PERCENT PASSING GRADATION RANGE AS FOLLOWS:

SIEVE SIZE	PERCENT PASSING
1"	100
#4	20-60
#10	0-30
#200	0-10



SANITARY SEWER
MANHOLE
NOT TO SCALE

GENERAL NOTES

MANHOLES SHALL BE CONSTRUCTED OF CONCRETE.

ALL MANHOLES ARE TO BE CONSTRUCTED CIRCULAR IN PLAN SIMILAR TO DRAWING.

CONCRETE IN MANHOLE SHALL BE NDOR 47B, VIBRATED IN PLACE.

ADJUSTING RINGS SHALL BE FINISHED WITH ONE HALF INCH PLASTER COAT ON THE OUTSIDE & INSIDE COMPOSED OF CEMENT MORTAR, ONE PART PORTLAND CEMENT AND THREE PARTS SAND BY VOLUME.

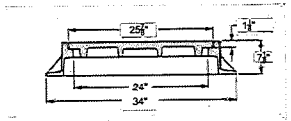
THE CAST IRON MANHOLE RING SHALL SET IN A BED OF MORTAR, AND CAREFULLY ADJUST TO PROPOSED GRADE.

MANHOLE FLOOR SHALL BE FINISHED TO A SMOOTH SURFACE.

PLACE VERTICAL SIDE OF TAPER SECTION FARTHEST FROM BACK OF CURB.

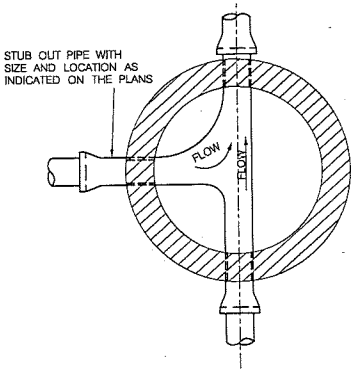
PIPE FITTINGS SHALL BE SOLVENT WELDED.



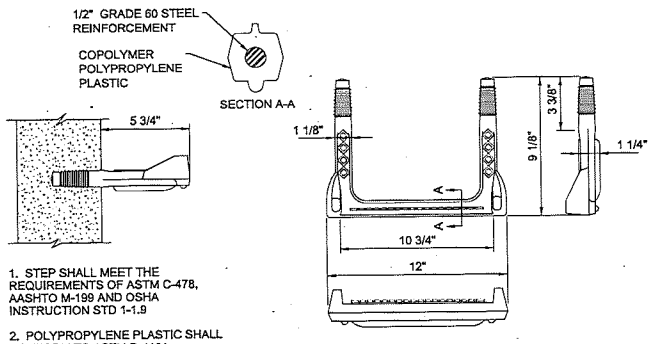


DEETER FOUNDRY HEAVY DUTY MANHOLE FRAME & SOLID LID, PRODUCT NO. R-1030 WITH "PROCESS WATER", OR APPROVED EQUAL.

PROCESS WATER MANHOLE
LID & FRAME DETAIL
NOT TO SCALE



TYPICAL
MANHOLE INVERT
NOT TO SCALE



1. STEP SHALL MEET THE REQUIREMENTS OF ASTM C-478, AASHTO M-199 AND OSHA INSTRUCTION STD 1-1.9

2. POLYPROPYLENE PLASTIC SHALL CONFORM TO ASTM D-4101

REINFORCED
PLASTIC STEPS
NOT TO SCALE

PROFESSIONAL CIVIL ENGINEER
FRANK J. DOLAND
E-7854
STATE OF NEBRASKA

NO.	REVISIONS	DATE

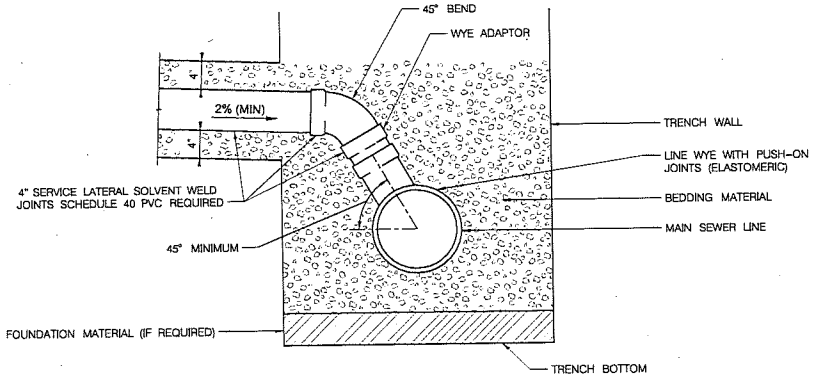
DETAILS

MONOLITH
SANITARY SEWER
HALLAM, NEBRASKA

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402-477-9000
Job No. 113270.00

PROJECT 113270.00
DATE 3/15/2018
SHEET
10 OF 16

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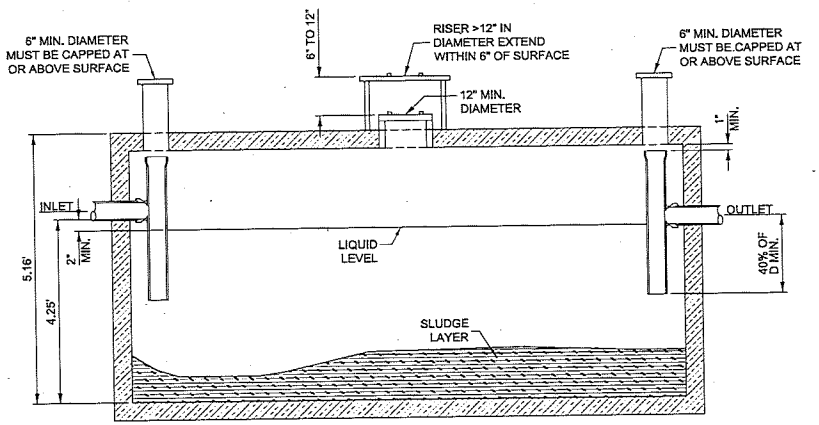
SANITARY SEWER
SERVICE CONNECTION
DETAIL
NOT TO SCALE

SEPTIC SERVICE CONNETION GENERAL NOTES

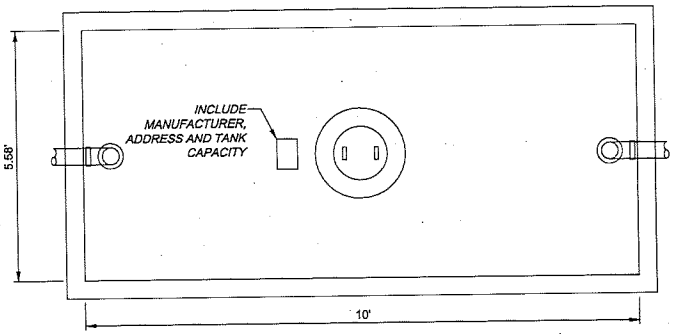
SERVICE WYE SHALL BE INSTALLED SO THAT SERVICE CONNECTION IS AT LEAST 45 DEGREES FROM HORIZONTAL

SERVICE LINE SHALL BE EXTENDED VERTICALLY AT PROPERTY LINE AND TERMINATED 5' BELOW FINISHED GRADE

SOLVENT WELDED CONNECTIONS ARE REQUIRED FOR THE ENTIRE SEWER SERVICE CONNECTION FROM LINE WYE TO THE CAP



PROFILE VIEW



PLAN VIEW

SEPTIC TANK DETAILS
NOT TO SCALE

PROFESSIONAL CIVIL ENGINEER
FRANK J. DOLAND
E-7854
STATE OF NEBRASKA

NO.	REVISIONS	DATE

DETAILS

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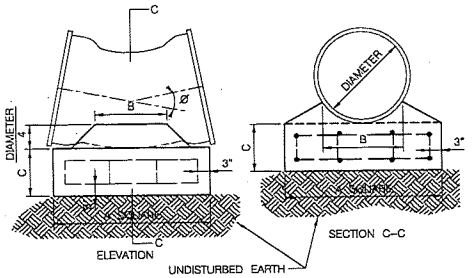
PROJECT 111270.00
DATE 3/18/2019
SHEET 11 OF 16

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REINFORCED CONCRETE THRUST BLOCK

DIAMETER	Ø=11 1/4" A	B	C	BAR SIZE	NUMBER OF BARS EACH WAY	STEEL (LBS.)	CONCRETE CUBIC YARDS	DIAMETER	Ø=22 1/2" A	B	C	BAR SIZE	NUMBER OF BARS EACH WAY	STEEL (LBS.)	CONCRETE CUBIC YARDS
6	1'-3"	0'-9"	1'-0"	–	–	–	0.1	6	1'-6"	0'-9"	1'-0"	–	–	–	0.1
8	1'-6"	1'-0"	1'-0"	–	–	–	0.1	8	1'-6"	1'-0"	1'-0"	–	–	–	0.1
12	1'-6"	1'-0"	1'-0"	NO 4	3	4.0	0.1	12	2'-3"	1'-0"	1'-0"	NO 4	3	7.0	0.2
16	2'-3"	1'-0"	1'-0"	NO 4	3	7.0	0.2	16	3'-0"	1'-0"	1'-0"	NO 4	5	16.7	0.4
20	2'-9"	1'-3"	1'-0"	NO 4	4	12.0	0.4	20	3'-9"	1'-3"	1'-0"	NO 4	7	30.4	0.6
24	3'-3"	1'-6"	1'-0"	NO 4	6	22.0	0.5	24	4'-6"	1'-6"	1'-3"	NO 5	6	50.1	1.1
30	4'-0"	2'-0"	1'-3"	NO 4	7	32.7	0.9	30	5'-6"	2'-0"	1'-6"	NO 5	9	93.9	1.9
36	4'-9"	2'-6"	1'-3"	NO 5	7	62.0	1.3	36	6'-9"	2'-6"	1'-9"	NO 5	12	169.5	3.3
48	6'-6"	3'-3"	1'-6"	NO 5	13	162.7	1.9	48	9'-0"	3'-3"	2'-0"	NO 10	6	438.9	6.7

DIAMETER	Ø=45° A	B	C	BAR SIZE	NUMBER OF BARS EACH WAY	STEEL (LBS.)	CONCRETE CUBIC YARDS	DIAMETER	Ø=90° A	B	C	BAR SIZE	NUMBER OF BARS EACH WAY	STEEL (LBS.)	CONCRETE CUBIC YARDS
6	1'-9"	1'-0"	1'-0"	–	–	–	0.2	6	2'-3"	1'-0"	1'-0"	–	–	–	0.2
8	2'-3"	1'-0"	1'-0"	–	–	–	0.2	8	3'-0"	1'-0"	1'-0"	–	–	–	0.4
12	3'-3"	1'-0"	1'-0"	NO 4	6	22.0	0.4	12	4'-3"	1'-0"	1'-3"	NO 5	6	47.0	0.9
16	4'-3"	1'-0"	1'-3"	NO 5	6	46.9	0.9	16	5'-9"	1'-0"	1'-6"	NO 5	10	109.5	2.0
20	5'-3"	1'-3"	1'-6"	NO 5	8	79.3	1.6	20	7'-0"	1'-3"	1'-9"	NO 5	15	203.4	3.3
24	6'-3"	1'-6"	1'-6"	NO 5	11	131.9	2.3	24	8'-6"	1'-6"	2'-0"	NO 6	15	360.5	5.6
30	7'-9"	2'-0"	1'-9"	NO 7	9	266.7	4.1	30	10'-6"	2'-0"	2'-3"	NO 9	10	680.0	9.5
36	9'-3"	2'-6"	2'-0"	NO 7	14	500.8	6.8	36	12'-6"	2'-6"	2'-9"	NO 10	11	1136.0	16.3
48	12'-3"	3'-3"	2'-6"	NO 10	11	1112.3	14.8	48	16'-9"	3'-3"	3'-6"	NO 11	16	2763.0	37.2

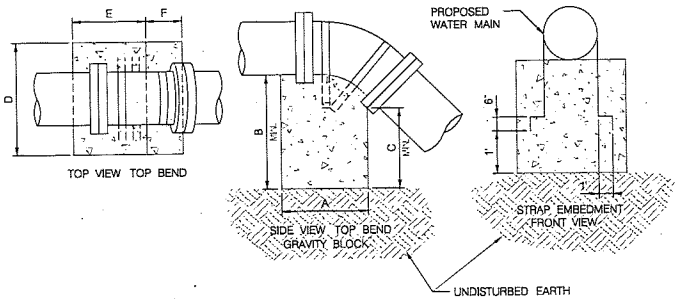


REINFORCED CONCRETE THRUST BLOCKS *

NOT TO SCALE

DOUBLE WRAP ALL JOINTS WITH POLYWRAP PRIOR TO PLACING CONCRETE BACKING BLOCKS.

COVER ALL STRAPS AND BEAMS OUTSIDE OF CONCRETE W/ POLYWRAP OR TAPE.



CONCRETE GRAVITY BLOCK

BEND	DIMENSION A	B MIN	C MIN	D	E	F	CONCRETE CY	STRAPS NO.	SIZE	EMBED.
16" x 45°	6'-0"	6'-0"	3'-0"	7'-0"	3'-0"	3'-0"	9.33	2	2" x 3/8"	30"
12" x 45°	6'-0"	5'-0"	2'-0"	5'-0"	3'-0"	3'-0"	4.72	2	2" x 1/4"	24"
8" x 45°	4'-0"	4'-0"	2'-0"	4'-6"	2'-0"	2'-0"	2.33	2	1" x 1/4"	18"
6" x 45°	3'-6"	3'-0"	1'-6"	3'-6"	2'-0"	1'-6"	1.43	2	1" x 1/4"	18"
16" x 22.5°	5'-6"	5'-6"	4'-6"	4'-6"	3'-0"	2'-6"	5.13	2	2" x 3/8"	30"
12" x 22.5°	4'-6"	5'-0"	4'-2"	3'-6"	2'-6"	2'-0"	2.88	2	2" x 1/4"	24"
8" x 22.5°	3'-0"	4'-0"	3'-6"	3'-0"	1'-6"	1'-6"	1.33	2	1" x 1/4"	18"
6" x 22.5°	2'-0"	3'-3"	3'-0"	3'-0"	1'-3"	0'-9"	0.72	2	1" x 1/4"	18"
16" x 11.25°	4'-0"	4'-0"	3'-6"	4'-0"	2'-0"	2'-0"	2.37	2	2" x 3/8"	30"
12" x 11.25°	3'-0"	3'-0"	2'-9"	3'-6"	2'-0"	1'-0"	1.17	2	2" x 1/4"	24"
8" x 11.25°	3'-0"	2'-0"	1'-9"	3'-0"	2'-0"	1'-0"	0.56	2	1" x 1/4"	18"
6" x 11.25°	2'-0"	2'-0"	1'-9"	2'-8"	1'-0"	1'-0"	0.40	2	1" x 1/4"	18"

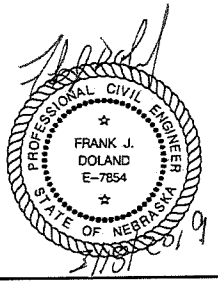
CONCRETE GRAVITY BLOCKS *

NOT TO SCALE

THRUST & RESTRAINT BLOCK GENERAL NOTES

1. ALL REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO A.S.T.M. SERIAL DESIGNATION A-305-507 AND SHALL SATISFY THE BEND TEST REQUIREMENTS FOR STRUCTURAL GRADE STEEL IN ACCORDANCE WITH THE REQUIREMENTS.
2. ALL CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3500 PSI.
3. ALL CONCRETE COLLARS SHALL BE CONSTRUCTED SUCH THAT THEY ARE ANCHORED AGAINST UNDISTURBED SOIL.
4. MINIMUM DEPTH OF EMBEDMENT FOR REINFORCING STEEL TO BE AS NOTED.
5. ALL REINFORCING STEEL SHALL BE EPOXY COATED.
6. POURED IN PLACE THRUST BLOCKING SHALL BE PROPERLY FORMED TO THE STATED DIMENSIONS AND SHALL NOT ENCASE THE M.J. BOLTS AND FASTENERS.
7. THRUST COLLARS FOR REDUCERS SHALL BE INSTALLED ON THE SMALL PIPE SIDE OF A REDUCER, HOWEVER THE SIZE SHALL BE BASED OFF OF THE LARGER DIAMETER PIPE.
8. GRAVITY BLOCK STRAPS OF THE SIZE AND TYPE SPECIFIED SHALL BE STATE STEEL TYPE M1020, OR EQUIVALENT, LOW CARBON, LOW MANGANESE, GENERAL PURPOSE, MERCHANT QUALITY STAINLESS STEEL THAT IS SUITABLE FOR FORMING AND WELDING.
9. ALL STRAP MATERIAL NOT EMBEDDED IN CONCRETE SHALL BE COVERED WITH POLYWRAP OR TAPE PRIOR TO BACKFILLING.

* NOTE: PIPE **SIZES SMALLER THAN 6" DIAMETER SHALL USE THRUST / GRAVITY / RESTRAINT BLOCK SIZES FOR A 6" DIAMETER PIPE.**



NO.	REVISIONS	DATE

DETAILS

MONOLITH
SANITARY SEWER
HALLAM, NEBRASKA

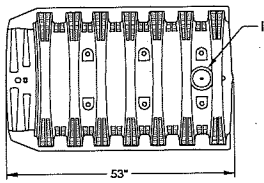
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DATE 3/19/2019
SHEET 12 OF 16

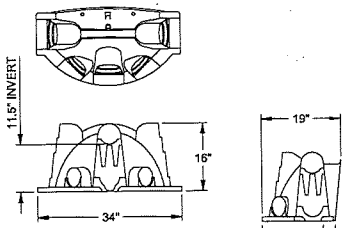
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ALL VIEWS = INSTALLED LENGTHS.

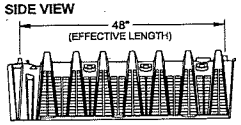
TOP VIEW



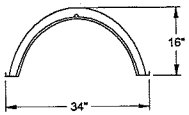
QUICK4 HIGH CAPACITY MULTIPORT END CAP



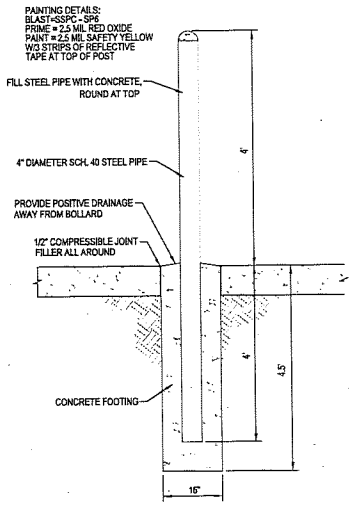
SIDE VIEW



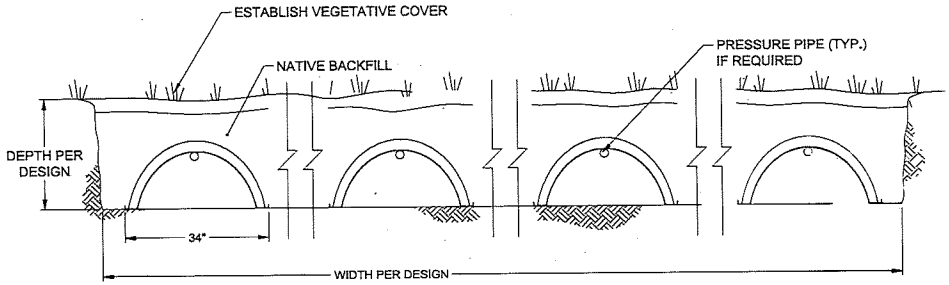
END VIEW



INFILTRATOR WATER TECHNOLOGIES
QUICK4 HIGH CAPACITY CHAMBER
PRODUCT SPECIFICATIONS
(NOT TO SCALE)

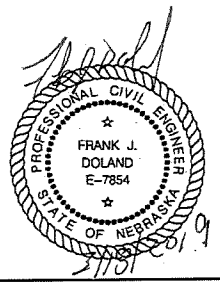


BOLLARD DETAIL
NOT TO SCALE



*SIZE OF SYSTEM DETERMINED BY DESIGN

INFILTRATOR WATER TECHNOLOGIES
QUICK4 HIGH CAPACITY CHAMBER
TYPICAL BED DETAIL
SECTION VIEW
(NOT TO SCALE)



NO.	REVISIONS	DATE

DETAILS

MONOLITH
SANITARY SEWER
HALLAM, NEBRASKA

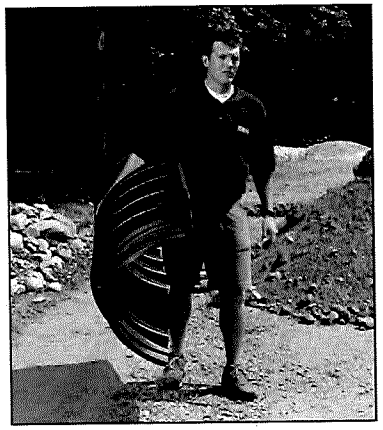
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PROJECT 111270.00
DATE 3/18/2019
SHEET
13 OF 16

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Septic System Installation Instructions

INFILTRATOR®
water technologies







Quick4® High Capacity Chambers
Quick4® Standard Chambers

Before You Begin

Quick4 High Capacity Chambers and Quick4 Standard Chambers may only be installed according to State and/or local regulations. If unsure of the installation requirements for a particular site, contact the local health department.

Like conventional systems, the soil and site conditions must be approved prior to installation. Conduct a thorough site evaluation to determine the proper sizing and siting of the system before installation.

Materials and Equipment Needed

- ❑ Quick4 Chambers
- ❑ MultiPort End Caps
- ❑ PVC Pipe and Couplings
- ❑ Backhoe
- ❑ Laser, Transit, or Level
- ❑ Shovel and Rake
- ❑ Tape Measure
- ❑ Utility Knife
- ❑ Hole Saw*
- ❑ 2-inch Drywall Screws*
- ❑ Screw Gun*
- ❑ Small Valve-Cover Box*
- ❑ 4-inch Cap for Inspection Port*

* Optional

These guidelines for construction machinery must be followed during installation:

- ❑ Avoid direct contact with chambers when using construction equipment. Chambers require a 12-inch minimum of compacted cover to support a wheel load rating of 16,000 lbs/axle or equivalent to an H-10 AASHTO load rating.
- ❑ Only drive across the trenches when necessary. Never drive down the length of the trenches.
- ❑ To avoid additional soil compaction, never drive heavy vehicles over the completed system.

Excavating and Preparing the Site

Note: As is the case with conventional systems, do not install the systems in wet conditions or in overly moist soils, as this causes machinery to smear the soil.

Note: The Quick4 Standard and Quick4 High Capacity chambers have a maximum cover depth of 48" for bed applications and 96" for trenches. Please refer to Infiltrator Cover Policy or call Infiltrator Water Technologies with any questions.

1. Stake out the location of all trenches and lines. Set the elevations of the tank, pipe, and trench bottom.

2. Install sedimentation and erosion control measures. Temporary drainage swales/berms may be installed to protect the site during rainfall events.

3. Excavate and level 3-foot wide trenches with proper center-to-center separation. Verify that the trenches are level or have the prescribed slope.

Note: Over excavate the trench width in areas where you are planning to contour.

4. Rake the bottom and sides if smearing has occurred while excavating. Remove any large stones and other debris. Do not use the bucket teeth to rake the trench bottom.

Note: Raking to eliminate smearing is not necessary in sandy soils. In fine textured soils (silts and clays), avoid walking in the trench to prevent compaction and loss of soil structure.

5. Verify that each trench is level using a level, transit, or laser.

Preparing the End Cap

1. With a utility knife start the tear-out seal at the appropriate diameter for the inlet pipe. The seal allows for a tight fit for 3-inch, 4-inch SDR35, and 4-inch SCH40 pipe.



Start tear-out seal.

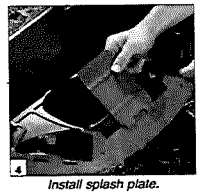
2. Pull the tab on the tear-out seal to create an opening on the end cap.

3. Snap off the molded splash plate located on the bottom front of the end cap.



Pull tab on tear-out seal.

4. Install splash plate into the appropriate slots below the inlet to prevent trench bottom erosion.



Install splash plate.

5. Insert the inlet pipe into the end cap at the beginning of the trench. The pipe will go in several inches before reaching a stop. (Screws optional.)



Insert inlet pipe.

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NO.	REVISIONS	DATE

MANUFACTURER'S DETAILS / SHOP DRAWINGS / CUT SHEETS

MONOLITH
SANITARY SEWER
HALLAM, NEBRASKA

benesch
Alfred Benesch & Company
825 M Street, Suite 100
Lincoln, Nebraska 68508
402.479.2200 Job No. 111270.00

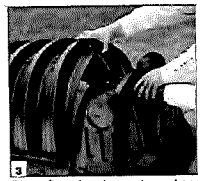
PROJECT 111270.00
DATE 3/18/2019
SHEET 14 OF 16

Installing the System

1. Check the header pipe to be sure it is level or has the prescribed slope.

2. Set the invert height at 11.5 inches from the bottom of the trench for the Quick4 High Capacity Chamber. For the Quick4 Standard Chamber, set the invert height at 8 inches from the bottom of the trench.

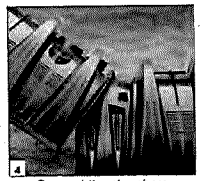
3. Place the inlet end of the first chamber over the back edge of the end cap.


3
Place first chamber onto end cap.

4. Lift and place the end of the next chamber onto the previous chamber by holding it at a 90-degree angle. Line up the chamber end between the connector hook and locking pin at the top of the first chamber. Lower to the ground to connect the chambers.

Note: When the chamber end is placed between the connector hook and locking pin at a 90-degree angle, the pin will be visible from the back side of the chamber.

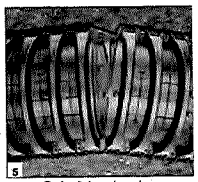
Note: The connector hook serves as a guide to ensure proper connection and does not add structural integrity to the chamber joint. Broken hooks will not affect the structure nor void the warranty.


4
Connect the chambers.

5. Swivel the chamber on the pin to the proper direction for the trench layout.

Note: Quick4 Chambers allow for 10 degrees of swivel in either direction at each joint.

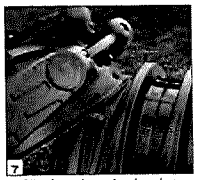
6. Where the system design requires straight runs, use the StraightLock™ Tabs to ensure straight connections. To activate the tabs, pop the tabs up with your thumb and lock into place.


5
Swivel the chamber.

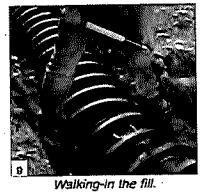
7. Continue connecting the chambers until the trench is completed.

Note: As the chambers are installed, verify they are level or have the prescribed slope.

8. The last chamber in the trench requires an end cap. Lift the end cap at a 45-degree angle and insert the connector hook through the opening on the top of the end cap. Applying firm pressure, lower the end cap to the ground to snap it into place. Do not remove the tear-out seal.


7
Attach end cap to chamber.

9. To ensure structural stability, fill the sidewall area by pulling soil from the sides of the trench with a shovel. Start at the joints where the chambers connect. Continue backfilling the entire sidewall area, making sure the fill covers the louvers.


9
Walking-in the fill.

10. Pack down the fill by walking along the edges of the trench and chambers. This is an important step in assuring structural support.

Note: In wet or clay soils, do not walk in the sidewalls.

11. Proceed to the next trench and begin with Step 1.

Installing Optional Inspection Ports

1. With a hole saw drill the pre-marked area in the top of the chamber to create a 4-inch opening.

2. Set a cut piece of pipe of the appropriate length into the corresponding chamber's inspection port sleeve.

Note: The sleeve will accommodate a 4-inch SCH40 pipe.

3. Use two screws to fasten the pipe to the sleeve around the inspection port.

4. Attach a threaded cap or cleanout assembly onto the protruding pipe at the appropriate height.

5. A small valve cover box may be used if inspection port is below the desired grade.

Covering the System

Before backfilling, the system must be inspected by a health officer or other official as required by State and local codes. Create an as-built drawing at this time for future records.

1. Backfill the trench by pushing fill material over the chambers with a backhoe. Keep a minimum of 12 inches of compacted cover over the chambers before driving over the system.

Note: Do not drive over system while backfilling in sand.

Note: For shallow cover applications, you must mound 12 inches of soil over the system before driving over it, and then grade it back to 6 inches upon completion.

2. It is best to mound several inches of soil over the finish grade to allow for settling. This also ensures that runoff water is diverted away from the system.

3. After the system is covered, the site should be seeded or sodded to prevent erosion.

Note: If the system is for new home construction, it is important to leave marking stakes along the boundary of the system. This will show contractors where the site is located so they will not cross it with equipment or vehicles.

Infiltrator Water Technologies Limited Warranty

(a) The structural integrity of each chamber, end cap and other accessory manufactured by Infiltrator ("Units"), when installed and operated in a leachfield or an onsite septic system in accordance with Infiltrator's instructions, is warranted to the original purchaser ("Holder") against defective materials and workmanship for one year from the date that the septic permit is issued for the septic system containing the Units; provided, however, that if a septic permit is not required by applicable law, the warranty period will begin upon the date that installation of the septic system commences. To exercise its warranty rights, Holder must notify Infiltrator in writing at its Corporate Headquarters in Old Saybrook, Connecticut within fifteen (15) days of the alleged defect. Infiltrator will supply replacement Units for Units determined by Infiltrator to be covered by this Limited Warranty. Infiltrator's liability specifically excludes the cost of removal and/or installation of the Units.

(b) THE LIMITED WARRANTY AND REMEDIES IN SUBPARAGRAPH (a) ARE EXCLUSIVE. THERE ARE NO OTHER WARRANTIES WITH RESPECT TO THE UNITS, INCLUDING NO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

(c) This Limited Warranty shall be void if any part of the chamber system is manufactured by anyone other than Infiltrator. The Limited Warranty does not extend to incidental, consequential, special or indirect damages. Infiltrator shall not be liable for penalties or liquidated damages, including loss of production and profits, labor and materials, overhead costs, or other losses or expenses incurred by the Holder or any third party. Specifically excluded from Limited Warranty coverage are damage to the Units due to ordinary wear and tear, alteration, accident, misuse, abuse or neglect of the Units; the Units being subjected to vehicle traffic or other conditions which are not permitted by the installation instructions; failure to maintain the minimum ground covers set forth in the installation instructions; the placement of improper materials into the system containing the Units; failure of the Units or the septic system due to improper sizing or improper sizing, excessive water usage, improper grease disposal, or improper operation; or any other event not caused by Infiltrator. This Limited Warranty shall be void if the Holder fails to comply with all of the terms set forth in this Limited Warranty.

Further, in no event shall Infiltrator be responsible for any loss or damage to the Holder, the Units, or any third party resulting from installation or shipment, or from any product liability claims of Holder or any third party. For this Limited Warranty to apply, the Units must be installed in accordance with all site conditions required by State and local codes; all other applicable laws; and Infiltrator's installation instructions.

(d) No representative of Infiltrator has the authority to change or extend this Limited Warranty. No warranty applies to any party other than the original Holder.

The above represents the standard Limited Warranty offered by Infiltrator. A limited number of States and counties have different warranty requirements. Any purchaser of Units should contact Infiltrator's Corporate Headquarters in Old Saybrook, Connecticut, prior to such purchase, to obtain a copy of the applicable warranty, and should carefully read that warranty prior to the purchase of Units.

For more information on the Quick4 Chambers, call **1-866-4QUICK4** or 1-866-478-4254.

Distributed By:

INFILTRATOR®
water technologies

6 Business Park Road, • P.O. Box 768
Old Saybrook, CT 06475
860-577-7000 • FAX 860-577-7001

U.S. Patents: 4,759,661; 5,017,041; 5,156,488; 5,336,017; 5,401,116; 5,401,459; 5,511,903; 5,716,163; 5,588,778; 5,839,849
Canadian Patents: 1,329,959; 2,004,064 Other patents pending

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NO.	REVISIONS	DATE

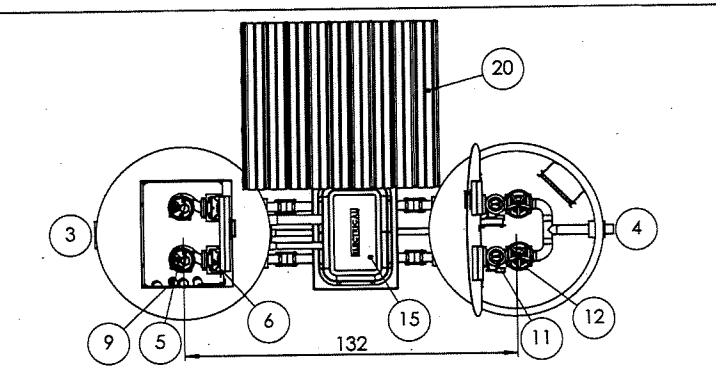
MANUFACTURER'S DETAILS / SHOP DRAWINGS / CUT SHEETS

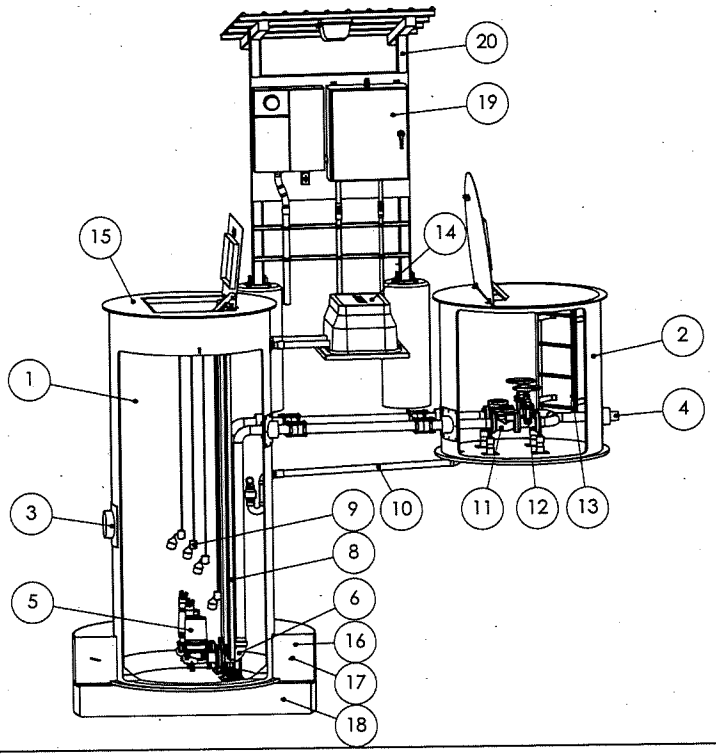
MONOLITH
SANITARY SEWER
HALLAM, NEBRASKA

benesch
Alfred Benesch & Company
625 M Street, Suite 100
Lincoln, Nebraska 68508
402-479-2200
Job No. 11127000

PROJECT 11127000
DATE 3/18/2019
SHEET 15 OF 16

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NO.	ELEV.	DESCRIPTION
1		60 IN X 204 IN FRP WET WELL
	00.00	RIM
	-17.00	BASE
2		60 IN X 66 IN FRP VALVE VAULT
	-5.50	BASE
3	-11.80	IE - 12 IN INLET HUB FOR 8 IN PIPE
		9:00 POSITION
4	-4.20	CENTERLINE - 3 IN SCH 10 STAINLESS STEEL OUTLET
		3:00 POSITION
5		HYDROMATIC HPGFH750 GRINDER PUMPS, 7.5 HP,
		460V/3, NON-EXPLOSION-PROOF, 66 GPM @ 93 FT TDH
		SHIPPED LOOSE
6		3 IN MTM DISCHARGE ELBOW
7		3 IN SCH 10 STAINLESS STEEL DISCHARGE MANIFOLD
8		1-1/4 IN SCH 40 STAINLESS STEEL SLIDE RAILS
9		LEVEL TRANSDUCER AND LEVEL SWITCHES
	-12.10	HIGH LEVEL ALARM
	-12.60	LAG PUMP ON
	-13.10	LEAD PUMP ON
	-14.50	PUMP(S) OFF
10		2 IN SCH 40 PVC DRAIN
11		3 IN LEVER AND WEIGHT CHECK VALVE
12		3 IN RESILIENT SEAT GATE VALVE
13		LADDER
14		ELECTRICAL HAND HOLE JUNCTION BOX ASSEMBLY
		SHIPPED LOOSE
15		300 PSF ALUMINUM HATCHES
16		CONCRETE ANTI-FLOTATION RING - 24 IN WIDE X 12
		IN TALL - 2 YDS - BY OTHERS
17		#4 REBAR REINFORCEMENT - BY OTHERS
18		12 IN COMPACTED BASE - BY OTHERS
19		DUPLEX ALTERNATING CONTROL PANEL
		SHIPPED LOOSE
20		AFS 72 IN PANEL RACK (OPTIONAL)
		SHIPPED LOOSE REQUIRES CONCRETE BASES AND
		FIELD ASSEMBLY BY OTHERS

CUSTOMER APPROVAL: _____ DATE: _____

BY THIS SIGNATURE, CUSTOMER INDICATES THAT HE HAS REVIEWED THIS SUBMITTAL DRAWING AND FOUND THAT IT MEETS ALL OF THE DESIGNER'S FUNCTIONAL REQUIREMENTS AND/OR SPECIFICATIONS. CUSTOMER HEREBY AUTHORIZES RC WORST & CO. INC. TO MANUFACTURE THE CUSTOM PRODUCT IN ACCORDANCEWITH THIS SUBMITTAL DRAWING.

AFS STN 60 204 60 66 30 30 SS EXT
MONOLITH - SANITARY LS -005 - PROJECT #42625R1
PACKAGED LIFT STATION

SHEET 1 OF 1

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REV NO	DATE
2.1	1/10/19
SCALE	
1:40	
DRAWN BY	
RJK	
CHECKED BY	
N/A	

AFS
625 BEST AVE
COEUR D'ALENE, ID 83814
PHONE 208 664 2133
4444 S YELLOWSTONE HWY
IDAHO FALLS, ID 83402
208.529.6868
4101 E BROADWAY
SPOKANE, WA 99202
PHONE 509.455.4616
WWW.RCWORST.COM

MONOLITH
SANITARY SEWER
HALLAM, NEBRASKA

MANUFACTURER'S DETAILS / SHOP DRAWINGS / CUT SHEETS

NO.	REVISIONS	DATE

benesch
Alfred Benesch & Company
1515 Wynkoop, Suite 500
Denver, Colorado 80202
303-572-0200

PROJECT 111270.00
DATE 3/18/2019
SHEET 16 OF 16

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Lincoln-Lancaster County Health Department
Environmental Public Health Division (402) 441-8027
3131 O Street Lincoln, Nebraska 68510-1514

ON-SITE WASTE WATER SYSTEM
CONSTRUCTION - INSTALLATION PERMIT
No. HS001909

System Type: Standard

Situs: 27077 SW 42ND ST, HALLAM, NE 68368

Issued: 10/10/2019

Expires: 10/10/2020

Description: S30, T7, R6, 6th Principal Meridian, LOT 20 NE

Owner: LUHRS HALLAM INVESTMENTS LLC
7376 N 122 AVE CIR
OMAHA, NE 68142

Patricia D. Lopez

Patricia D. Lopez, RN, MSN, Interim Health Director

Dear Applicant:

The above document is your permit to construct a new On-site Waste Water System at the location listed. Please contact this office once the sytem is complete in order to schedule a final inspection before use.

Patricia D. Lopez

Patricia D. Lopez, RN, MSN
Interim Health Director

DUSTIN BARRETT
151 S 66TH RD
NEBRASKA CITY, NE 68410

BARRETT CONSTRUCTION

Since 1947

NEBRASKA CITY, NE





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402-873-3292 OFFICE

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Lincoln-Lancaster County Health Department
Environmental Public Health Division
3140 N Street • Lincoln NE 68510-1514
Phone: 402-441-8643

SCANNED

A

Permit Number
#S001909

Onsite Wastewater Treatment System Permit Application

Include Form B and C. Submit correct fee with this Application

☒ Septic System ☐ Lagoon ☐ Other (Refer to Form C)

PLEASE PRINT OR TYPE

A. Onsite System Location

Address* 27077 SW 42nd St. (no rural route) City Hallam, NE Zip 68368

Legal Description SE (1/4) 30 (1/4 Section) 7N (Township) 6E (Range) 6th Principal Meridian (Subdivison) 20 (Addition) (Block) (Lot)

PID 0730200003000 *Approx. Address (If to be determined)

B. Owner

Name Monolith Materials Signature

Address 134 S. 13th St, Suite 700 City/State/Zip Lincoln, NE 68508

Home Phone Work Phone 402 413-5763

C. Certified Installer

Name: Dustin J Barrett Signature

Address 151 S. 66th Rd City/State/Zip Nebraska City, NE 68410

Work Phone 402 873-3292

D. Engineer

☒ Check and complete if engineer designed system P.E. License Number: F-7854

Designer Name Frank Doland Firm Alfred Benesch & Company Work Phone 402 479-2200

E. This system will serve a

☐ Residential Dwelling Number of Bedrooms Whirlpool Bathtub? ☐ Yes ☐ No Garbage Grinder? ☐ Yes ☐ No Total Acres 68

☒ Commercial Establishment/Other Facility Specify Carbon Black Production Design flow in gallons per day 1,684

Type of Wastewater ☒ Domestic ☐ Non-Domestic

DO NOT WRITE BELOW THIS LINE

Approval Process

1. Health Department
Site visits 10/10/19
Comments
Date rec'd 10/10/19
Date frwd 10/10/19
ACTION ☒ Approved ☐ Disapproved
Signature

2. Supt. Bldg. Insp. or Village Clerk
Comments
Date rec'd
Date frwd
ACTION ☐ Approved ☐ Disapproved
Signature

3. City or County Engineer
Comments
Date rec'd
Date frwd
ACTION ☐ Approved ☐ Disapproved
Signature

Installation Final Written Approval
By
Date 10/26/19

Business Office Use Only
Date Received 10-07-19 Amount Paid $430.00
Received By Cash/Check No 30267

White - Health Department Yellow - Engineer Pink - Building & Safety

Form A Updated: 4/15

Lancaster County Health Department
Environmental Public Health Division
3140 N Street • Lincoln NE 68510-1514
Phone: 402-441-8643

Exhibit 5

Permit Number: HS 00 1909

Onsite Wastewater Treatment System

Inspection Sheet

Date 10/21/19

Legal Description ____ ¼ ____ ¼ ____ Section/Township/Range

Onsite System Location

Address (no rural route) 27077 SW 42 City ____

Owner ____ Address ____

Mark One: ☐ Dwelling ☐ Non-dwelling

☐ New System ☐ Alteration [☐ Tank Only ☐ Trench Only] ☐ Lateral Only

☐ Temporary modification (Describe problem causing discharge and reason for temporary modification): ____

Drainfield Absorption System: System constructed and installed as per NDEE Permit 10/21/19 DS

☐ Lateral ☐ Bed ☐ Non-standard (engineer-designed and NDEQ approved) ☐ Holding Tank ☐ Trench

Total square feet of drainfield ____ Sq. Ft. Tank Size ____ gals

Total length of laterals ____ Type of Distribution: ☐ Chamber ☐ Perforated Pipe ☐ Other (describe) ____

No. of Absorption Laterals ____ Width ____ No. of Drop Boxes ____ Distribution Box ____

Leveling Method Used ____

Setbacks (Check the Boxes Below if the Required Setback has been Satisfied):

Distance From	Private Well	Public Well	Surface Water	Ground water	Pressure Water Lines	Property Lines
Tank (ft)	50 ☐	500 ☐	50 ☐	NA ☐	10 ☐	5 ☐
Field (ft)	100 ☐	500 ☐	50 ☐	4 ☐	25 ☐	5 ☐

Geographical Coordinates to 6 Decimals:

Tank ____

Lateral #1 ____ Lateral #3 ____

Lateral #2 ____ Lateral #4 ____

Comments:

Inspections prior to Final Approval
Initial DS Date 10/18/19

Follow-Up ____ Date ____

Follow-Up ____ Date ____

Installation Final Written Approval
By Doug Rouse

Date 10/21/19

Field Note Drawing (See Reverse Side):