• I. S. D. S. PERMIT •

TO INSTALL, CONSTRUCT, ALTER OR REPAIR
AN INDIVIDUAL SEWAGE DISPOSAL SYSTEM

Permit: EH-13-017

New: Y
Repair: N
Alteration: N
Addition: N

ROUTT COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH • P.O. BOX 770087 • STEAMBOAT SPRINGS, CO • 970-870-5588

This permit effective only on premises located at: **23555 STATE HIGHWAY 131 C**
Legal description of property: 10AC IN SW4NW4 SEC 4-3-85 TOTAL 10A
Parcel Id.: 960042001 Lot No.:

Owner: PIANO, DAN & SARAH
Address: 23555 HIGHWAY 131
OAK CREEK CO 80467-0467
Phone: 970-846-7485

Applicant: I-DESIGN OF STEAMBOAT INC.
Address: ATTN: ANDY BENJAMIN PO BOX 212
PHIPPSBURG CO 80469
Phone: 970-736-0040

As authorized and required by Chapter 25, Article 10 C.R.S., permission is hereby granted to the owner or a Routt County licensed ISDS installer to construct or repair an I.S.D.S. system at the property indicated above. All work must comply with the specifications on this permit and the Guidelines on Individual Sewage Disposal Systems - Revised 1988 - Colorado State Board of Health, 5 CCR 1003-6. This permit expires one year from date of issue.

SPECIFICATIONS

Y Residential N Commercial Other: **Number of bedrooms: 4**
Percolation Rate: 28 MPI
Minimum Septic Tank Capacity: 1250 gallon
Tank Material: Y Concrete N Polyethylene
Design: 1: Engineer shall certify that construction complies with permitted design.
Comments: SG 07/30/2013 CONTRACTOR SHALL COORDINATE INSPECTION WITH NORTHWEST COLORADO CONSULTANTS. NWCC TO INSPECT & CONFIRM CONSTRUCTION ACCORDING TO DESIGN.
Notice: All Sewage *HOLDING* Tanks must be Concrete. Inspections required (24 hour advanced notice required).

Environmental Health Specialist: **Date of Issue:** 7/30/2013

The above individual sewage disposal system installed by _____ has received a final inspection. The system is hereby approved for use.

Environmental Health Specialist: **Date** 9/20/2013

Fee:	**State fee**	**$23.00**
	Percolation	**$0.00**
	Permit	**$277.00**
		$300.00

RECEIPT

RECEIPT NUMBER: R130000834

Routt County Environmental Health Department
P.O. Box 770087 Phone 970-870-5588
Steamboat Springs, CO 80477

APD #: EH-13-017 TYPE: EH-Ind. Sewage Disp Sys
SITE ADDRESS: 23555 STATE HIGHWAY 131 C
PARCEL: 960042001

May include fees collected within the jurisidiction.

TRANSACTION DATE:	07/30/2013	TOTAL PAYMENT:	300.00
		TOTAL PAID FROM TRUST:	.00
		TOTAL PAID FROM CURRENCY:	300.00

TRANSACTION LIST:

Type	Method	Description	Amount
Payment	Check	#12536	300.00
		TOTAL:	300.00

ACCOUNT ITEM LIST:

Description	Account Code	Current Pmts
I.S.D.S. Permit Fee	01-20-22-000-568	277.00
State Surcharge for ISDS	01-20-22-000-546	23.00
	TOTAL:	300.00

RECEIPT ISSUED BY: SG INITIALS: SAG
ENTERED DATE: 07/30/2013 TIME: 09:18 AM

OK per Mike Zopf 7/30/13

EH 13-017 Foundation - Repair N/A

BUILDING PERMIT # ~~CB-13-172~~
PERMIT PD 300.00
PERC PD ______

ch# 12536
I-Design of Stmbt Inc.

APPLICATION FOR ON-SITE WASTEWATER SYSTEM PERMIT

NEW X REMODEL___ REPAIR___ EMERGENCY USE___

Name of Owner Dan & Sarah ______ Mailing Address 23555 Hwy 131 Oak Creek, CO Phone 970-846-7455

Name of Applicant I-Design ______ Mailing Address PO Box 212 Phippsburg CO 80469 Phone 970-736-0040

LOCATION OF PROPOSED SY[STEM] ______ State Hwy 131

Legal Description ______ (Lot# ______ ID# 96004200 1 (this # can be found in the Assessor's Office)

Size of Lot 10 A ______)Other (Describe)______

Number of: Bedrooms 4

Water Supply: (X) Private Well
( ) Public (give name of supply)______

1. According to Design; 2. Contractor Shall coordinate w/ NWCC inspection.

w/ 1250 gal ST.

6 quick 4 infs ~ 63 EQ 36

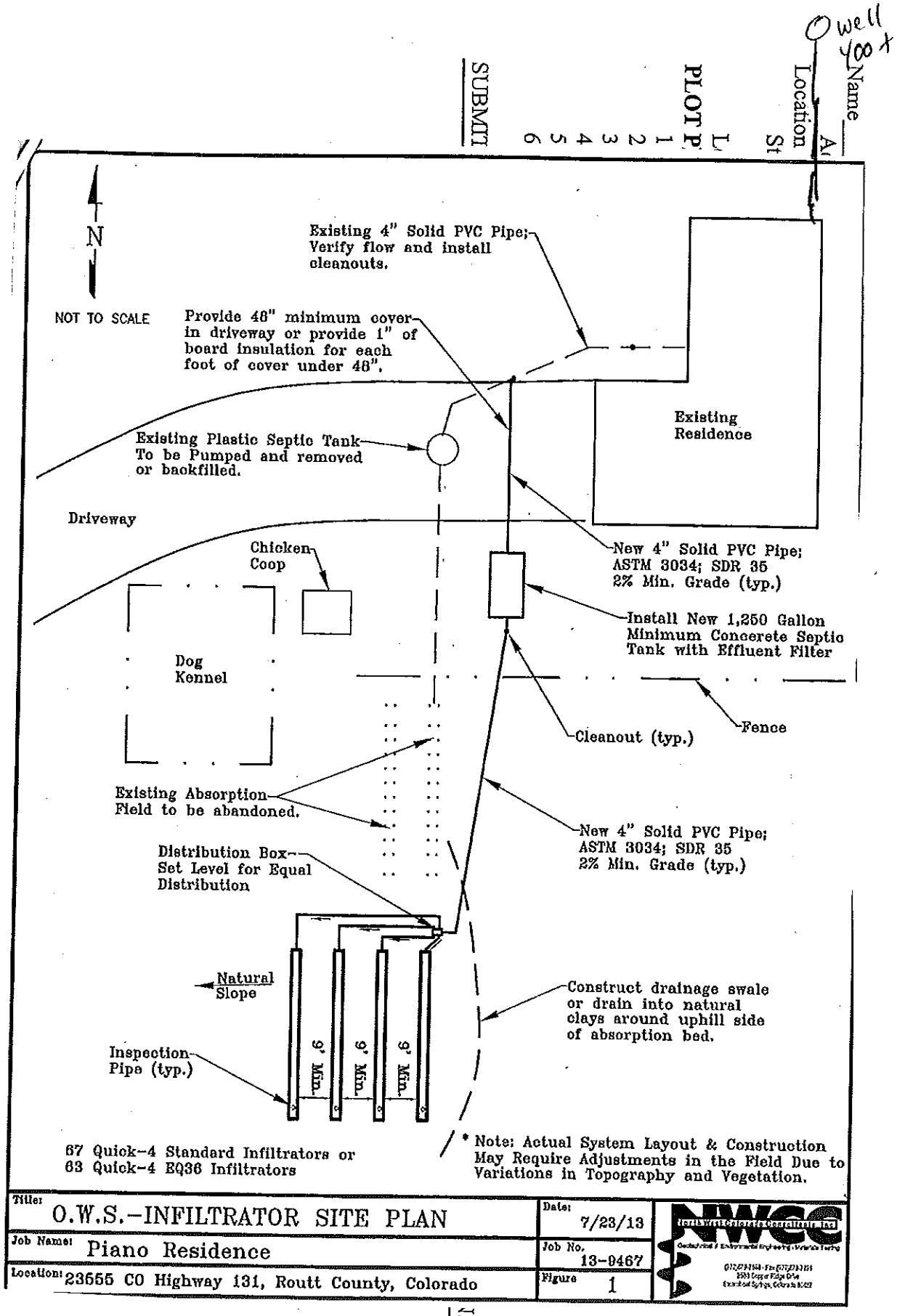
846-8923

Call ANDY when Permit is Ready

An appropriate plot plan must accompany this application showing required information. Percolation tests and an on-site inspection must be conducted by a Colorado Registered Professional Engineer, P.E. or the Routt County Department of Environmental Health after receipt of the application and plot plan. The permit, upon approval of this application may be obtained at the Routt County Department of Environmental Health with payment of the required fee.

Application for an individual wastewater system is hereby submitted. The on-site wastewater system will be constructed, installed and operated in accordance with the regulations governing individual sewage disposal systems within Routt County and will comply with applicable State Regulations adopted pursuant to Article 10 of Title 25, C.R.S. 1973, as amended. The undersigned acknowledges that the above information is true and that false information will invalidate the application or subsequent permit. The owner assumes all responsibility in case of failure or inadequacy of this sewage disposal system. (*Hot tubs and Jacuzzis shall not be connected to on-site sewage disposal systems.)

Signature of Applicant [signature] Date 7/25/13



PLOT PLAN

Title: O.W.S.–INFILTRATOR SITE PLAN	Date: 7/23/13	NWCC Northwest Colorado Consultants, Inc.
Job Name: Piano Residence	Job No. 13-0467	
Location: 23655 CO Highway 131, Routt County, Colorado	Figure 1	

North West Colorado Consultants, Inc.
Geotechnical / Environmental Engineering • Materials Testing
Celebrating 20 Years of Service
1992 - 2012

July 24, 2013

I-Design
P.O. Box 212
Phippsburg, CO 80469

Attn: Andy Benjamin

Job Number: 13-9467

Subject: On-Site Wastewater System Design, Piano Residence, 23555 Colorado State Highway 131, Routt County, Colorado.

Dear Andy,

As requested, NWCC, Inc. (NWCC) has completed an On-site Wastewater System (OWS) design for the Piano Residence located at 23555 Colorado State Highway 131 in Routt County, Colorado. NWCC understands the existing OWS was recently inspected by a maintenance contractor who determined the system had failed. Therefore, NWCC has been hired by I-Design to design a new OWS.

Existing Construction: It is our understanding the existing residence has been constructed with a total of four bedrooms. The new OWS absorption field will be located southwest of the existing residence and south of the existing absorption field. The existing septic tank and absorption field are to be properly abandoned.

Site Conditions: The residence is located east of Colorado State Highway 131 in Routt County, Colorado. The new absorption field site will be located approximately 100 feet south-southwest of the residence in undisturbed, vacant land vegetated with grasses and weeds.

Topography at the proposed absorption field site is variable and generally slopes moderately down to the west on the order of 8 to 12 percent. A site plan showing the approximate locations of existing structures and proposed OWS septic tank and absorption field are shown on Figure 1.

Subsurface Conditions: To investigate the subsurface conditions at the proposed absorption field site, two profile pits were observed by NWCC on July 18, 2013. The subsurface conditions encountered in the profile pits consisted of approximately 42 to 48 inches of topsoil and organic materials overlying natural clays to the maximum depth investigated, 7 feet. The clays were sandy, fine-grained, low to moderately plastic, stiff, moist and brown in color. Groundwater seepage was not encountered in the profile pits at the time of our site visit and no evidence of a seasonal high groundwater table was observed.

(970) 879-7888 • Fax (970) 879-7891
2580 Copper Ridge Drive • Steamboat Springs, CO 80487

Percolation testing was conducted at the proposed absorption field site on July 18, 2013. Tests indicate the upper 30 to 36 inches of natural soils displayed percolation rates ranging from 13 to 40 minutes per inch (mpi) with an average percolation rate of 28 mpi.

System Design: Based upon our understanding of the existing construction and site conditions, NWCC recommends the use of a seepage trench soil absorption system utilizing infiltration chambers placed in the upper 12 inches of natural topsoil and organics. NWCC also recommends a new septic tank be installed.

The OWS design presented below is based upon the existing construction, anticipated usage and the average percolation rate for the natural soils. Considering the anticipated usage (4 bedrooms), a peak effluent flow of 1,050 gallons per day (gpd) is anticipated for the system. Based upon percolation test results, an absorption area of 1,111 square feet is required for a conventional trench absorption system. A 40% area reduction for use of Infiltrator® chambers results in a required absorption area of 667 square feet. The installation of either 67 Standard Infiltrator® chambers or 63 EQ36 Infiltrator® chambers will satisfy minimum area requirements. The proposed system layout is shown on Figure 1. It should be noted that variations in the chamber configurations may be required due to topography and vegetation.

The base of all chambers should be wrapped or covered with a ¼ inch galvanized steel or other approved, durable mesh material to prevent rodent intrusion. If the system is not in regular use, NWCC recommends periodic flooding of the system to reduce rodent intrusion. All manufacturer installation and backfill requirements should be observed. A minimum of 18 inches of topsoil fill should be provided over installed chambers.

A two chambered 1,250-gallon concrete septic tank is recommended for effluent pretreatment. An effluent filter should be provided at the septic tank outlet. Both tank access manholes should be extended as required and exposed at final grades.

The system design is presented in Figures 1 and 2. The design calculations are shown in Appendix A and the specifications for the system are given in Appendix B. The procedures and design criteria used in this design were obtained from the EPA "Design Manual - On-site Wastewater Treatment and Disposal Systems", 1980, as well as the Colorado Department of Health "Guidelines on Individual Sewage Disposal Systems", revised 2000, and the Routt County Individual Sewage Disposal Regulations, February 1999.

Operation and Maintenance: Observing the operation and performing routine maintenance of the OWS is essential to allow proper, long term functioning of the system. We recommend the operation be monitored and a qualified, licensed maintenance contractor performs maintenance of the system.

1) *Septic Tank*: The scum and sludge accumulation in the septic tank should be monitored yearly. Once the scum or sludge thickness reaches 25% of the chamber depth, the septic tank should be pumped. A pumping frequency of 2 to 4 years is likely at the design flows. Depending on use, pumping may only be required every 3 to 7 years.

2) *Effluent Filter*: The effluent filter at the septic tank outlet should be cleaned when the septic tank is inspected or as required.

3) *Absorption Field*: If the system is not activated within 30 days of installation or is inactive for an extended period of time, we recommend the infiltration system be periodically flooded (once every 30 days) to discourage rodent nesting activity. Nesting activity could result in premature failure of the system. The absorption field should also be fenced off to vehicular traffic and livestock. The surface area around the absorption field should be observed monthly for signs of failure, such as lush vegetation growth or ponding. Liquid levels in the seepage trench should be observed through the inspection pipe.

4) *Treated Water*: NWCC does not recommend water softeners or water treatment systems be connected to the OWS. The chemical and hydraulic loading from the backwash of these treatment systems may be detrimental to the OWS. If a treatment system is used, a separate dry well should be constructed for the backwash waste. In addition, chemically treated water from a swimming pool or spa must not be discharged into the OWS.

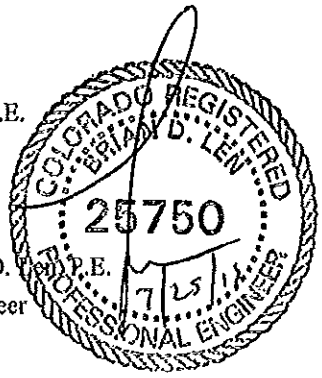
5) *General Notes*: The owner should be aware that the operation of the OWS is different from a public sewer service. Plastic and other non-biodegradable materials should not be placed into the system. Water use should be monitored so fixtures are not allowed to run if a seal malfunctions. Allowing fixtures to flow continuously to prevent water lines from freezing or a malfunctioning faucet or toilet can consume in excess of 1,000 gallons per day. Excessive flows could flood and cause premature failure of the system. No plastic or landscaping that requires additional irrigation should be placed over the absorption field.

Limitations: The procedures and design criteria used in this design were obtained from the EPA "Design Manual - On-site Wastewater Treatment and Disposal Systems", 1980, as well as the Colorado Department of Health "Guidelines on Individual Sewage Disposal Systems", revised 2000, and the Routt County Individual Sewage Disposal Regulations, February 1999. The OWS design presented is based on currently accepted design procedures, the proposed structure and usage of the facility. If the usage of the structure or addition of new facilities to those currently planned in the building changes, the OWS design will also most likely change. It should also be noted that all on-site wastewater systems require periodic maintenance as noted above. The failure of the owner to provide periodic inspection and maintenance of the system can lead to premature system failure.

Please be advised that Colorado law requires that a permit must be obtained prior to construction, alteration or use of an on-site wastewater system. In addition, this office must be retained by the client to observe the construction/installation of the OWS and to provide an as-built report to the Routt County Department of Environmental Health.

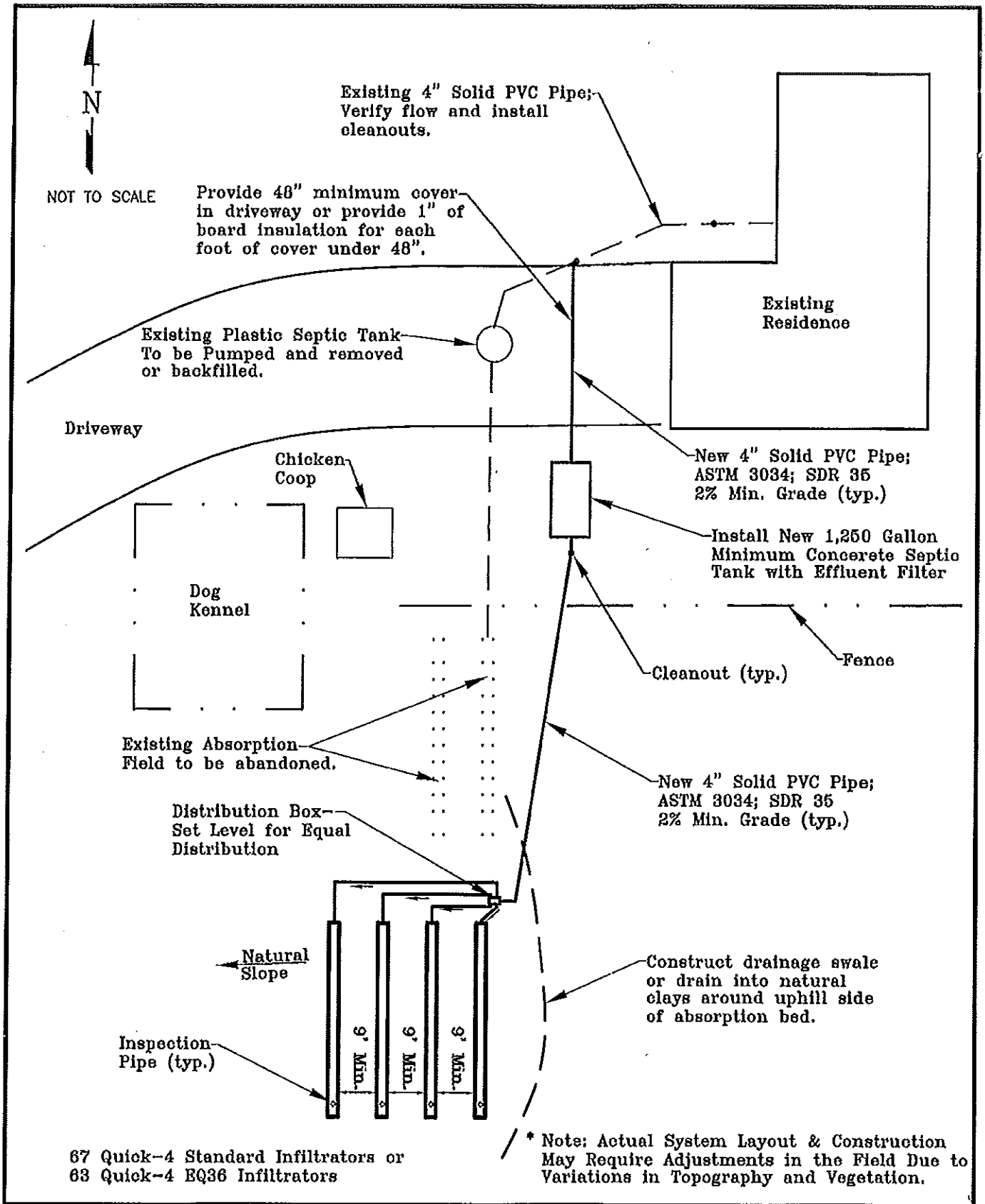
If you have any questions concerning this report, or if we may be of further service, please contact this office.

Sincerely,
NWCC, INC.



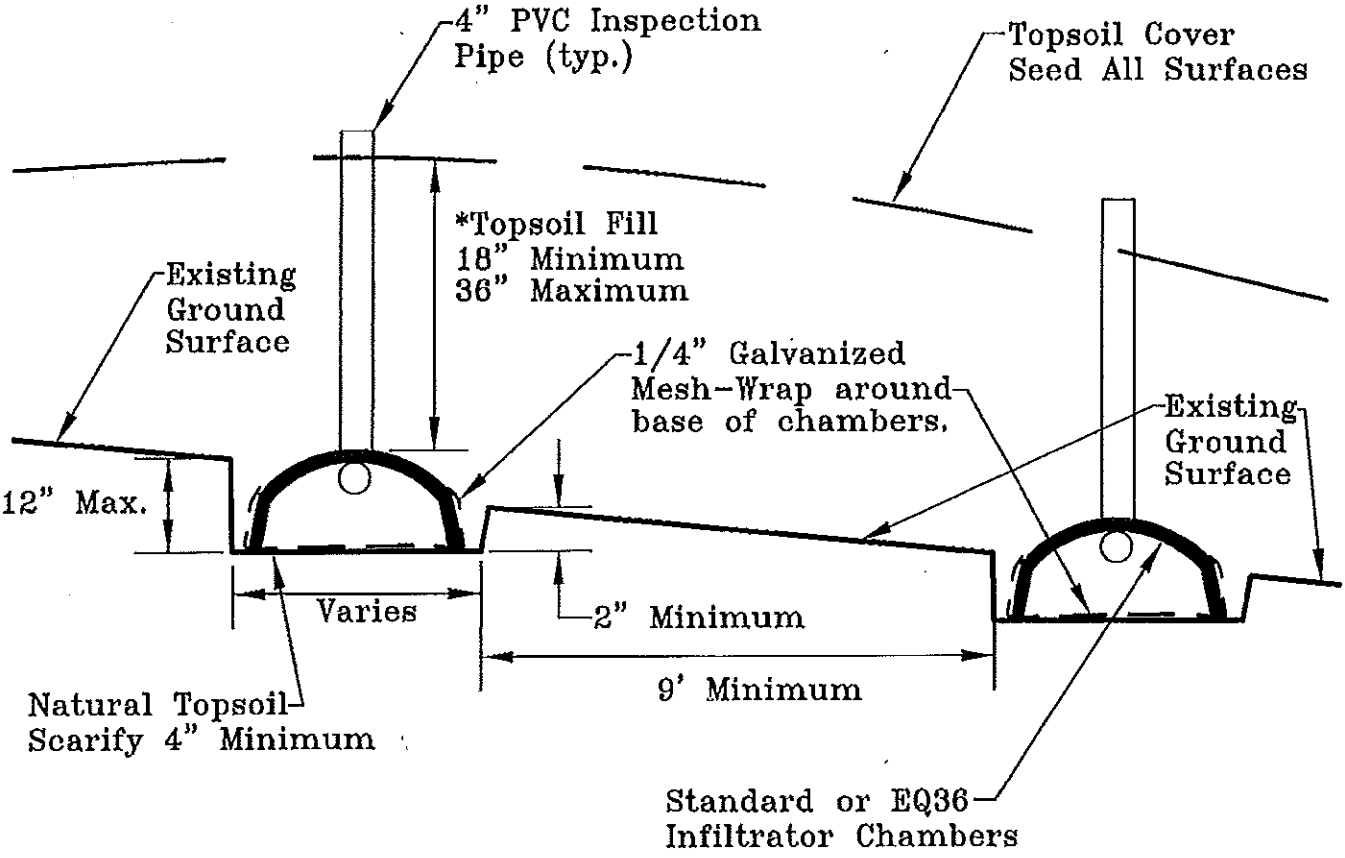
Timothy S. Travis, P.E.
Project Engineer

Reviewed by Brian D. Len, P.E.
Senior Project Engineer



Title: O.W.S.–INFILTRATOR SITE PLAN	Date: 7/23/13	NWCC Northwest Colorado Consultants, Inc. Geotechnical / Environmental Engineering · Materials Testing
Job Name: Piano Residence	Job No. 13-9467	
Location: 23555 CO Highway 131, Routt County, Colorado	Figure 1	

* The chambers should be backfilled in accordance with the manufacturer's recommendations.



Title: INFILTRATOR SYSTEM CROSS SECTION	Date: 7/23/13	NWCC Northwest Colorado Consultants, Inc. Geotechnical / Environmental Engineering · Materials Testing
Job Name: Piano Residence	Job No. 13-9467	
Location: 23555 Colorado Highway 131, Routt County, Colorado	Figure 2	

APPENDIX A

SUMMARY OF DESIGN CALCULATIONS

A. Sewage Volume Calculations

1) Number of Bedrooms:.....4x 150 gpd/bedroom

2) Total Average Flow .....600 gpd

3) Peak Factor .....x 1.75

4) Peak Flow for Design.....Q = 1,050 gpd

B. System Sizing

1) Minimum absorption area = Q $(t^{1/2})/5$ = $(1,050)(28)^{1/2}/5$ = 1,111 ft^2

2) Less 40% for Standard or Quick-4 Infiltrator® Chambers: 1,111 x 0.60 = 667 ft^2

3) No. of Quick-4 Std. Infiltrator® Chambers: 667 ft^2/10 ft^2/chamber = 66.7 chambers => use 67 Quick-4 Standard Infiltrator® chambers.

3A) No. of Quick-4 EQ36 Infiltrator® Chambers: 667 ft^2/10.67 ft^2/chamber = 62.5 chambers => Use 63 Quick-4 EQ36 Infiltrator® chambers.

4) Septic Tank, Per Routt County Regulations- Minimum 2-chambered 1,250-gallon septic tank.

5) Minimum well and open water setback-per Routt County Regulations: 100 feet.

6) Minimum seasonal drainage setback-per Routt County Regulations: 25 feet.

7) Minimum property line setback-per Routt County Regulations: 10 feet .

8) Minimum potable water line setback-per Routt County Regulations: 25 feet.

APPENDIX B

1) Construction and installation must meet Routt County Department of Environmental Health and the Colorado Department of Health regulations.

2) Periodic inspections must be made by NWCC at the following points during construction:

a. After infiltration chamber and distribution piping placement, but before pipes are covered.

b. Upon final completion of the project.

3) PVC pipe shall meet or exceed ASTM 3034/SDR35 requirements. Pressure piping shall meet or exceed Sch40 PVC pressure rating requirements.

4) Tank excavation backfill may consist of suitable on-site or imported materials and shall be backfilled in 6 to 8-inch loose lifts mechanically compacted to at least 95% of the maximum standard Proctor density. NWCC recommends the use of washed or screened rock backfill beneath inlet and outlet piping. Rock fill should be compacted to at least 80% of the maximum relative density (ASTM D4253/4254).

5) Provide a minimum of 12 inches of soil cover over the septic tank and 24 inches of soils cover over all pipes. Manhole lids should be exposed at final grades. Provide manhole ring extensions as needed to final grades. Provide non-shrink grout at all plumbing connections for water-tightness.

6) Surface drainage shall be ditched and diverted away from wastewater disposal areas.

7) Disturbed surfaces, mounds and berms shall be covered with topsoil and heavily seeded.

8) Inspection pipes to be constructed of PVC pipe with the pipe penetrating into the chamber.

9) Cleanouts must be placed in the solid distribution line at maximum intervals of 100' downstream of the septic tank and at a maximum interval of 50' upstream of the septic tank.

10) It is the responsibility of the owner and the installer to comply with all minimum setback requirements.

North West Colorado Consultants, Inc.
Geotechnical / Environmental Engineering • Materials Testing
Celebrating 20 Years of Service
1992 - 2012

September 9, 2013

I-Design
P.O. Box 212
Phippsburg, CO 80477

Attn: Andy Benjamin

Job Number: 13-9467

Subject: On-site Wastewater System Observations, Piano Residence, 23555 Colorado State Highway 131, Routt County, Colorado.

Dear Andy,

As requested, NWCC, Inc. (NWCC) visited the project site on August 9 and 16, 2013 to observe the On-site Wastewater System (OWS) being constructed for the Piano Residence located at 23555 Colorado State Highway 131 in Routt County, Colorado. NWCC previously prepared the design under this job number and dated July 24, 2013.

Site Observations: At the time of our site visit on August 2, 2013, the installer, I-Design, had installed a new 1,250-gallon concrete septic tank near the plan location. Building sewer piping (ASTM 3034; SDR 35) from the residence to the septic tank and outlet piping from the septic tank to a plastic distribution box was observed and met minimum grade requirements. Tank inlet and outlet 'T' connections appeared to have been installed properly. No effluent filter was observed at the septic tank outlet.

NWCC observed that 1 run of 15, 2 runs of 16 and 1 run of 17 chambers (a total of 64 Quick-4 EQ-36 Infiltrator® chambers) had been installed near the plan location. Distribution piping (ASTM 3034; SDR 35) between the distribution box to each Infiltrator® run had been installed and appeared to meet the minimum grade requirements. It appeared the chambers were installed a maximum of 12 inches below the natural ground surface. We observed galvanized mesh wrapping at the base and sides of the chambers. Inspection pipes installed near the end of each chamber run were observed. An as-built drawing taken from field measurements is presented on Figure 1.

NWCC advised the installer chamber system backfill should be placed in accordance with the manufacturer's recommendations and that an 18-inch minimum and a 36-inch maximum cover should be provided over the absorption system. Please note, if sufficient amounts of fill are not placed over the chambers, seepage may occur during high usage periods. NWCC advised the installer a minimum of 24 inches of soil cover should be provided over sewer piping in landscape areas and a minimum of 48 inches of cover was required for building sewer piping located beneath the driveway. If 48 inches of cover is not

possible, NWCC recommended that at least 1-inch of rigid foam board insulation be provided for each foot of cover less than 48 inches. All disturbed areas should be heavily seeded with a drought tolerant grass.

At the time of our August 15 site visit, we observed the septic tank, absorption field and piping had been backfilled. It appeared that sufficient fill depths had been provided over the septic tank, distribution pipes and chambers. The risers on the septic tank had been raised to the finished ground surface and the effluent filter had been placed in the outlet 'T' of the septic tank. The lids should be properly secured or locked to prevent unauthorized access. A drainage swale had also been constructed above the absorption field.

Based on our part time observations, it appears that the portions of the system that were completed at the time of our site visits had been constructed in general accordance with the design with the noted exceptions. NWCC believes the system should function properly with proper care and maintenance if the components not completed at the time of our visits were properly constructed.

Operation and Maintenance: Observing the operation and performing routine maintenance of the OWS is essential to allow proper, long term functioning of the system. NWCC recommends system operation be monitored and a qualified, licensed maintenance contractor performs maintenance of the system.

1) *Septic Tank*: The scum and sludge accumulation in the septic tank should be monitored yearly. Once the scum or sludge thickness reaches 25% of the chamber depth, the septic tank should be pumped. A pumping frequency of 1 to 3 years is likely at the design flows. Depending on use, pumping may only be required every 3 to 7 years.

2) *Effluent Filter*: The effluent filter at the septic tank outlet should be cleaned when the septic tank is inspected or as required.

3) *Absorption Field*: NWCC recommends water regular usage of the system to discourage rodent nesting and burrowing in the chambers. Rodent activity could result in premature failure of the system. If the system is not activated within 30 days of installation or is inactive for an extended period of time, periodic flooding (up to several hundred gallons) of the system is recommended. The system should be fenced off to vehicular traffic and livestock. The ground surface around the absorption fields should be observed monthly for signs of failure, such as lush vegetation growth or ponding. Liquid levels within each run of Infiltrators should be observed through the observation/vent pipes.

4) *Treated Water*: NWCC does not recommend water softeners or water treatment systems be connected to the OWS. The chemical and hydraulic loading from the backwash of these treatment systems may be detrimental to the OWS. If a treatment system is used, a separate dry well should be constructed for the backwash waste. In addition, chemically treated water from a swimming pool or spa must not be discharged to the OWS.

5) *General Notes*: The owner should be aware that the operation of the OWS is different from a public sewer service. Plastic and other non-biodegradable materials should not be placed into the system. Water use should be monitored so fixtures are not allowed to run if a seal malfunctions.

Allowing fixtures to flow continuously to prevent water lines from freezing or a malfunctioning faucet or toilet can consume in excess of 1,000 gallons per day. Excessive flows could flood and cause premature failure of the system. No plastic or landscaping that requires additional irrigation should be placed over the absorption field.

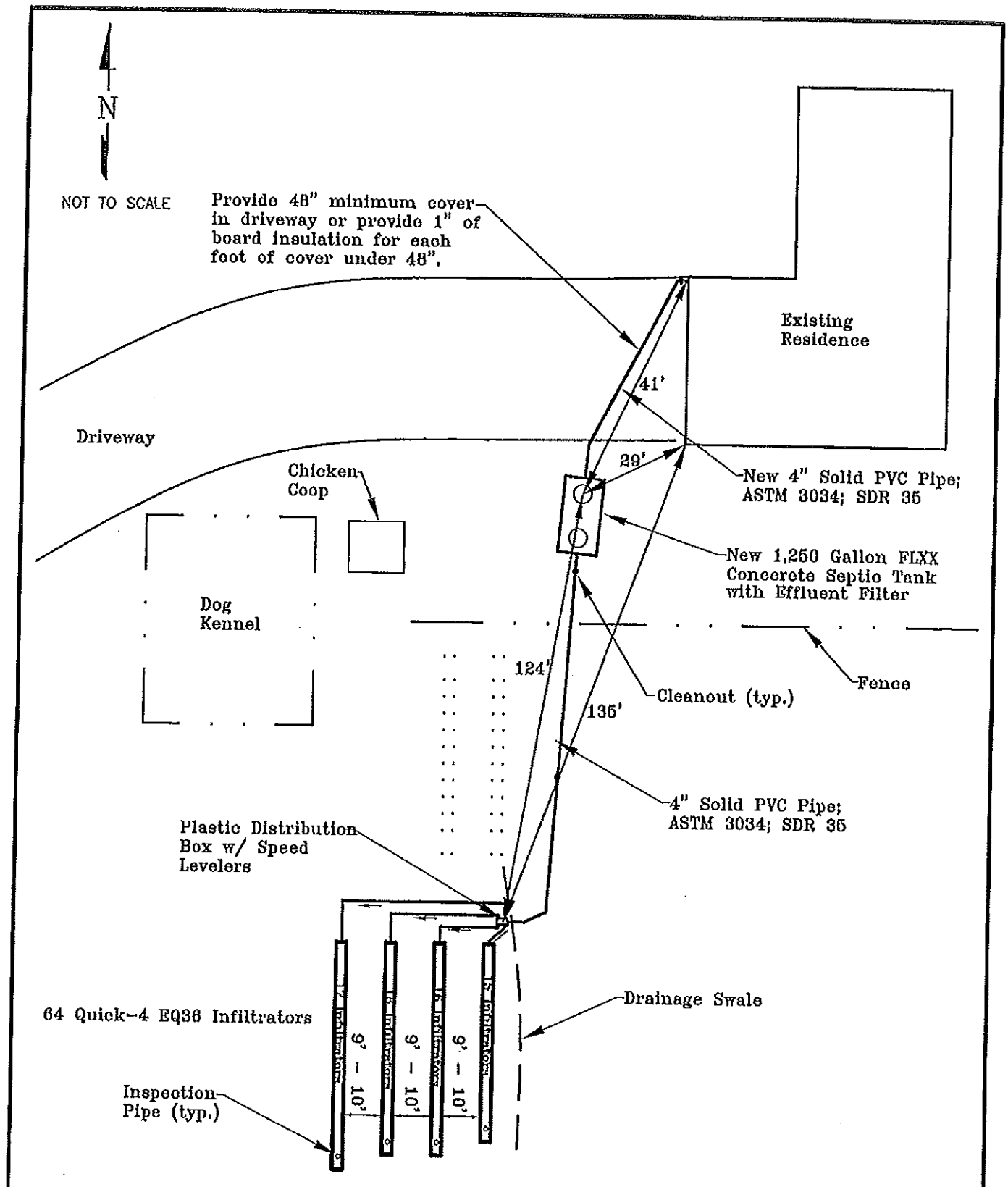
If you have any questions regarding this report, our observations or recommendations or if we may be of further service, please contact the undersigned. A copy of this report has been submitted to the Routt County Department of Environmental Health.

Sincerely,
NWCC, INC.,

Timothy S. Travis, P. E.
Project Engineer

Reviewed by Harold N. Schlicht, P.E.
Senior Project Engineer

cc: Routt County Department of Environmental Health



Title: O.W.S.-AS BUILT	Date: 9/9/13	NWCC Northwest Colorado Consultants, Inc.
Job Name: Piano Residence	Job No. 13-0467	
Location: 23555 CO Highway 131, Routt County, Colorado	Figure 1	