Public Health
HEALTH AND HUMAN SERVICES

The Point on Norman
Ph. 13; Lot 1356

4625-91-0781

RICHARD O. BRAJER
Secretary

DANIEL STALEY
Director, Division of Public Health

June 16, 2016

Mr. Adrian Pruett
Iredell County Health Dept
610 East Center Ave
Mooresville, NC 28115

Subject: Approval of Septic Tank Location at 276 Milford Circle, Mooresville, Iredell County

Dear Mr. Pruett:

We have received additional information from Jeffrey Swartz, PE, regarding the existing septic tank located at 276 Milford Circle, Mooresville, Iredell County, NC.

After reviewing the additional information, the septic tank is approved at its current location.

If you have any questions or comments, please feel free to contact me at 919-707-5878 or trish.angoli@dhhs.nc.gov.

Sincerely,

Tricia Angoli, PE
On-Site Wastewater Engineering

cc: Dean Rossi
Jeffrey Swartz, PE

Adrian Pruett

From: Adrian Pruett
Sent: Wednesday, June 15, 2016 9:48 AM
To: 'Angoli, Trish'
Subject: RE: FW: Engineering Requirements for Septic Tank to close to foundation

Trish,
I concur with the data submitted. If you don't mind please send me an approval letter.

Thank you for your time, have a great day.

Sincerely,

Adrian L. Pruett, REHS, LSS
Environmental Health Supervisor I
On-site Water Protection Program
610 E. Center Ave
Mooresville, NC 28115
704-660-3633

From: Angoli, Trish [mailto:trish.angoli@dhhs.nc.gov]
Sent: Wednesday, June 15, 2016 8:05 AM
To: Adrian Pruett
Subject: FW: FW: Engineering Requirements for Septic Tank to close to foundation

Adrian,

Are you comfortable with the most recent information? If yes, would you like me to write a letter?

Thanks
Trish

Patricia M. Angoli, PE
Environmental Engineer
Division of Public Health, On-Site Water Protection Branch
North Carolina Department of Health and Human Services

919-707-5878 office
919-845-3973 fax
trish.angoli@dhhs.nc.gov
http://publichealth.nc.gov

5605 Six Forks Rd
1642 Mail Service Center
Raleigh, NC 27699-1642



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From: Dean Rossi [mailto:deanrossi84@gmail.com]
Sent: Tuesday, June 14, 2016 2:49 PM
To: Angoli, Trish
Cc: Adrian Pruett; Jeff Swartz
Subject: Re: FW: Engineering Requirements for Septic Tank to close to foundation

Dear Ms. Angoli,

Just wondering if you need any additional information from either myself, the tank manufacturer, or the Professional Engineer at this point?

On Fri, Jun 3, 2016 at 8:28 AM, Dean Rossi <deanrossi84@gmail.com> wrote:

Dear Ms. Angoli,

Per your request, I worked through Adrian Pruett this week to determine the manufacturer of my septic tank. From the original permit, Adrian was able to determine that the original manufacturer of the tank was Dellinger Pre-Cast from Denver, NC. I contacted Dellinger Pre-Cast and spoke to Jeff Flowers regarding the situation and your request. Mr. Flowers then provided the specifications of the tank (see attached). When asking Mr. Flowers the question that you posed, he said "as long as a Registered Professional Engineer shows that there is no risk of failure, then he is okay with it". Since the original calculations that Mr. Swartz (Registered Professional Engineer) was done based off of assumptions, I then forwarded Mr. Swartz the tank specifications as received from Mr. Flowers at Dellinger Pre-Cast. Mr. Swartz revised his calculations and provided me with a new report (see attached). As you can see, the engineering calculations show that there is no increased risk of tank failure in its current location.

Thank you.

On Tue, May 31, 2016 at 5:07 PM, Angoli, Trish <trish.angoli@dhhs.nc.gov> wrote:

Prior to a final decision on the proposal, I would like to know if the tank manufacturer concurs with the PE's proposal and are they comfortable with the installation constraints.

Thanks

Trish

Patricia M. Angoli, PE

Environmental Engineer

Division of Public Health, On-Site Water Protection Branch

North Carolina Department of Health and Human Services

919-707-5878 office

919-845-3973 fax

trish.angoli@dhhs.nc.gov

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From: Dean Rossi [mailto:deanrossi84@gmail.com]
Sent: Friday, May 20, 2016 8:30 AM
To: Angoli, Trish
Cc: Adrian Pruett; Jeff Swartz
Subject: Fwd: FW: Engineering Requirements for Septic Tank to close to foundation

Dear Ms. Angoli,

I wanted to personally thank you for taking the time to look into this matter. Per your request, the revised PE stamped report from Jeff Swartz and a picture of the structure is attached for your review.

Just for the record, I think its worthy to note that I did not have this structure built. I purchased this house in August of 2014 and the unpermitted building was not disclosed during the real estate transaction. Ever since I found out about the issue I have been working diligently to correct the issue.

I would also like to let you know that I have a BS degree in environmental health from Purdue University and have been working for large companies like GE, Stanley Black and Decker, and Ingersoll-Rand protecting the environment, the communities in which we operate, and our employees for over 25 years. I take great pride in the work that I do to protect the above mentioned.

With that said, if at any point I had information that this tank was at an increased risk of failing or if the structure was a pathway to allow sewer gas into the home, I would not hesitate spending the $15,000+ to move the tank. Since the engineering calculations show that there is no increased risk of collapse, and because there is no HVAC system in the structure that allows a pathway of sewer gas into the home, I am therefore requesting that the tank be left in place and that a variance be granted.

To Adrian's earlier comments, I have also been working diligently with the Iredell County building permit office. Since the PE indicates that the unpermitted structure has been built to code, once I receive the septic tank variance I can then move to permit the outdoor buildings per guidance from the Iredell County building permitting office.

Just so you know, I plan an taking the previous owners to court over this issue. As an environmental, health, and safety professional, I believe it is important to hold those accountable for the willful act of not following the rules of getting the buildings permitted and NOT disclosing this issue during the real estate transaction. It is my hope that the court sees in my favor and appropriately punishes those who willfully went around the rules.

Thank you for your time and understanding of this most troublesome issue. Looking forward to hearing your response.

---------- Forwarded message ----------
From: **Adrian Pruett** <adrian.pruett@co.iredell.nc.us>
Date: Tue, May 17, 2016 at 9:21 AM
Subject: FW: Engineering Requirements for Septic Tank to close to foundation
To: "Dean Rossi (deanrossi84@gmail.com)" <deanrossi84@gmail.com>

Please see the response from Trish Angoli, State Engineer, below.

Sincerely,

Adrian L. Pruett, REHS, LSS

Environmental Health Supervisor I

On-site Water Protection Program

610 E. Center Ave

Mooresville, NC 28115

704-660-3633

From: Angoli, Trish [mailto:trish.angoli@dhhs.nc.gov]
Sent: Monday, May 16, 2016 4:54 PM
To: Adrian Pruett
Subject: RE: Engineering Requirements for Septic Tank to close to foundation

Adrian,

Sorry for the slow response. I have gotten backed up recently.

Below is the information we have requested when a tank is located to close to a building foundation or footing. The calculations must be signed and sealed by a NC PE.

In cases where a tank is installed closer than five feet to a footing or building foundation all of the following information needs to be submitted:

1. A drawing showing the location of the tank and the foundation, with the exact separation distance in the field.
2. Calculations showing the effect of the tank and the foundation on each other, which would include the vertical forces acting on the foundation.

3. Include the references for the design calculations and assumptions made.

The letter you provided does not include all the information identified above.

Please let me know if you need anything else.

Thanks

Trish

Patricia M. Angoli, PE

Environmental Engineer

Division of Public Health, On-Site Water Protection Branch

North Carolina Department of Health and Human Services

919-707-5878 office

919-845-3973 fax

trish.angoli@dhhs.nc.gov

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From: Adrian Pruett [mailto:adrian.pruett@co.iredell.nc.us]
Sent: Wednesday, May 04, 2016 9:16 AM
To: Angoli, Trish
Subject: Engineering Requirements for Septic Tank to close to foundation

Trish,

It's been awhile since we spoke, I hope you are doing well. I have a question about the requirements to leave an existing tank septic tank to close to a house. At the moment the tank is 12" off of the foundation and the homeowner first decided to relocate, which we issued a permit for, but now he has decided that he doesn't want to do that and is fighting our decision…so he spoke to our building department and they told him that he could get an engineer out there and say everything is good and he could keep the tank as is. Here is the issue, the engineer just wrote a letter referencing the soil weight on the tank and how the structure isn't effecting it but I don't feel that is sufficient to meet requirements (see attached letter). I was under the impression that we would require a complete structural design and a modification to the foundation bringing it below the tank to ensure there was no impact on the structural integrity of the tank. If you have time can you please clarify what is required and if it is even possible.

Thanks for your time and have a great day.

Sincerely,

Adrian L. Pruett, REHS, LSS

Environmental Health Supervisor I

On-site Water Protection Program

610 E. Center Ave

Mooresville, NC 28115

704-660-3633

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--

Regards,
Dean A. Rossi

651.343.9416 (M)
DeanRossi84@gmail.com (e)

--

Regards,
Dean A. Rossi

651.343.9416 (M)
DeanRossi84@gmail.com (e)

--
Regards,
Dean A. Rossi

651.343.9416 (M)
DeanRossi84@gmail.com (e)

JEFFREY J. SWARTZ, PE, LEED AP
585 B AND T LANE
TAYLORSVILLE, NORTH CAROLINA 28681

June 20, 2016

Dean & Sheri Rossi
276 Milford Circle
Mooresville, NC 28117

Re: Unpermitted Addition Evaluation
Septic Tank Setback Encroachment Evaluation (Supplement)
276 Milford Circle
Mooresville, NC 28117
Job Number: 2016-20

Dear Mr. & Mrs. Rossi:

This letter has been prepared to supplement the letter dated May 19, 2016.

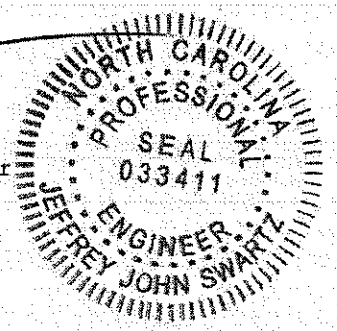
The septic tank manufacturer, Dellinger Precast, provided a detail sheet for the tank they supplied for the reference address. General note 3 of the detail sheet states that the design conforms to the structural design loading from ASTM C890. ASTM C890 Table 1 provides an earth fill load of 100 to 150 pcf. ASTM C890 Table 2 provides a walkway load of 300 psf. With a maximum back fill depth of 3 feet, these loads combined would mean that the tank should be rated for between 600 psf and 750 psf.

Based on these design loading conditions, the assumed 500 psf maximum load from the referenced letter dated March 19, 2016 is less than the design load requirements of ASTM C890. Therefore my prior recommendation remains unchanged.

Let me know if you have any questions regarding the observations and recommendations mentioned above. Please do not hesitate to call me at (828) 632-0499.

Sincerely,

Jeffrey J. Swartz
Professional Engineer



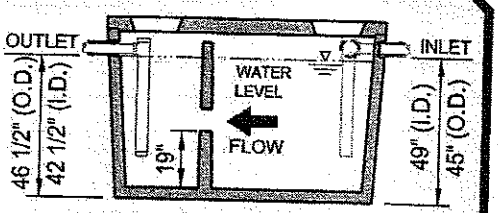
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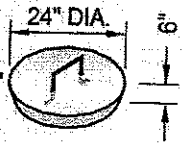
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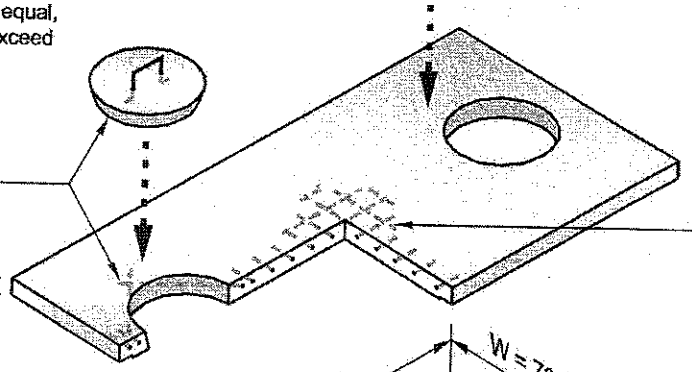
GENERAL NOTES:

1. Design specifications conform to latest ASTM C1227 specifications "Precast Concrete Water and Wastewater Structures"
2. Concrete compressive strength 4,000 psi minimum.
3. Steel reinforcing design to conform to the requirements of ASTM C890 specifications for "Structural Design Loading for Water and Wastewater Structures" and shall utilize grade 60 re-bars conforming to the requirements of ASTM A615 or WWF conforming to the requirements of ASTM A185 or both. Place Additional reinforcing at all openings.
4. Optional EZ set lid cast in place. Supplied by Dellinger Precast. To be field adjusted using approved methods by contractor.
5. Pipe penetration locations as per job requirements. Pipe inlet and outlet locations to have PSX Direct Drive boots or equal. Pipe Inlet locaions (typical 3 sides) to be knock out pannels. Effluent Filter supplied by Dellinger. Inlet Tee & Pipe supplied by contractor.
6. Joints to be sealed with ConSeal CS102. butyl rubber joint sealant or equal. Sealant meets or exceeds the requirements of latest federal specification SS-S-0021(210-A), AASHTO M-198B, and ASTM C-990-91.
7. Lift Insert / Lift Eye Pin by M.A Industries or equal, Cast-in by Dellinger Precast. Lifts meet or exceed OSHA requirements.
8. Method of manufacture is Wet Cast.
9. Sections are monolithic. Weights:
   Top Slab 3,134 ± lbs.
   Base Section 9,751 ± lbs.
10. I.D. = Inside dimension
    O.D. = Outside dimension
    L = Length
    W = Width
    H = Height

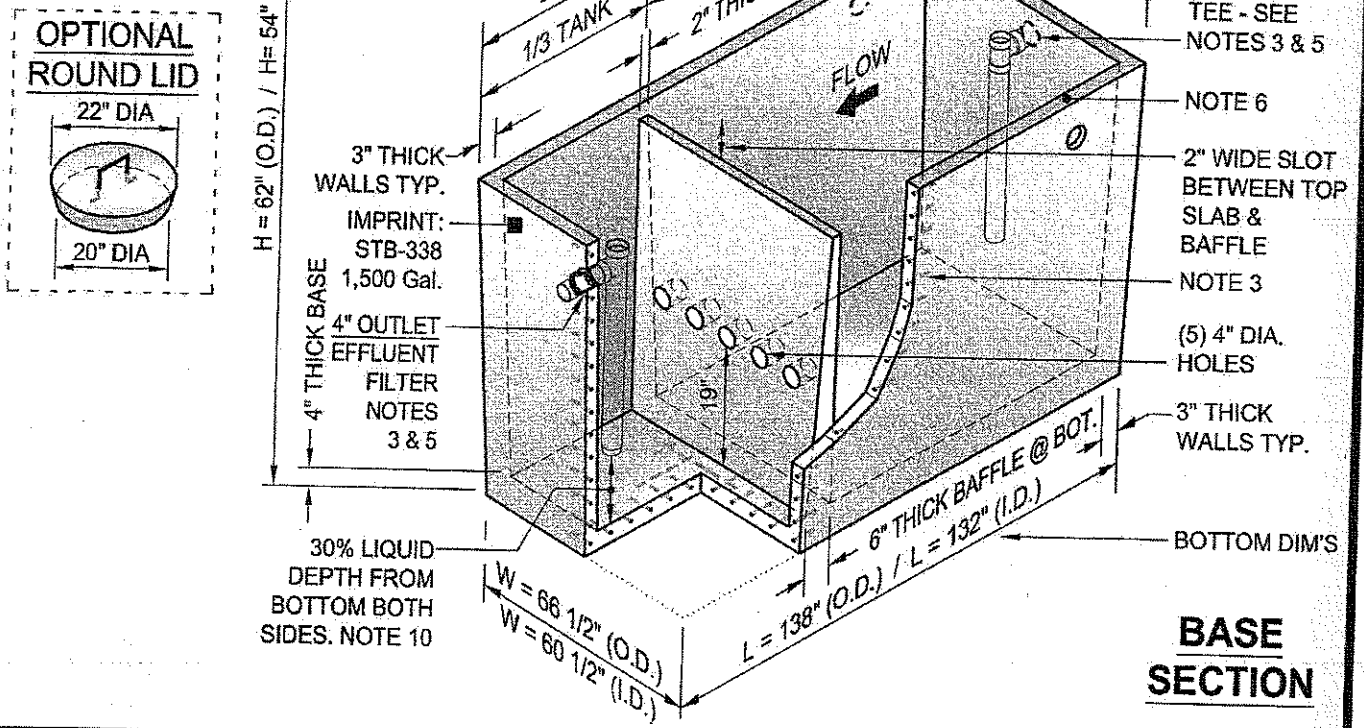


ELEVATION





TOP SLAB



BASE SECTION

OPTIONAL ROUND LID

1,500 Gallon (Top Slab) SEPTIC TANK

DELLINGER PRECAST
4531 North Hwy 16 • Denver, N.C. 28037 • Phone: 800-948-1666 • 704-483-2868 • Fax: 704-483-2363

Scale: Not To Scale
Revision Date: February 2008
Detail # ST-1,500-TS

FOR REFERENCE ONLY

5. Design Loads

5.1 *Dead Loads:*

5.1.1 Permanent vertical loads typically include the weight of the road bed, walkways, earth backfill, and access opening covers.

5.1.2 Recommended unit weights of materials for design are shown in Table 1.

5.2 *Traffic Loads:*

5.2.1 The vehicle and pedestrian loadings are shown in Table 2.

5.2.2 The arrangement and spacing of vehicle wheels are shown in Fig. 1 and Fig. 2.

5.2.3 *Distribution of Wheel Loads through Earth Fills:*

5.2.3.1 For structures where vehicle wheels contact the top surface of the structure, the vehicle wheel loads will be distributed over an area as shown in Fig. 3. The loaded area will be:

$$A = W \times L \quad (1)$$

where:

A = wheel load area, ft^2 (m^2),
W = wheel width, ft (m), and
L = wheel length, ft (m).

5.2.3.2 For below ground structures where backfill separates the vehicle wheels and the top surface of the structure, the vehicle wheel loads will be distributed as a truncated pyramid as shown in Fig. 4.

The loaded area will be:

$$A = (W + 1.75\,H) \times (L + 1.75\,H) \quad (2)$$

where:

A = wheel load area, ft^2 (m^2),
W = wheel width, ft (m),
L = wheel length, ft (m), and
H = height of backfill between wheels and structure, ft (m).

5.2.3.3 When several distributed wheel load areas overlap, the total wheel load will be uniformly distributed over a composite area defined by the outside limits of the individual areas. Such a wheel load distribution is shown in Fig. 5.

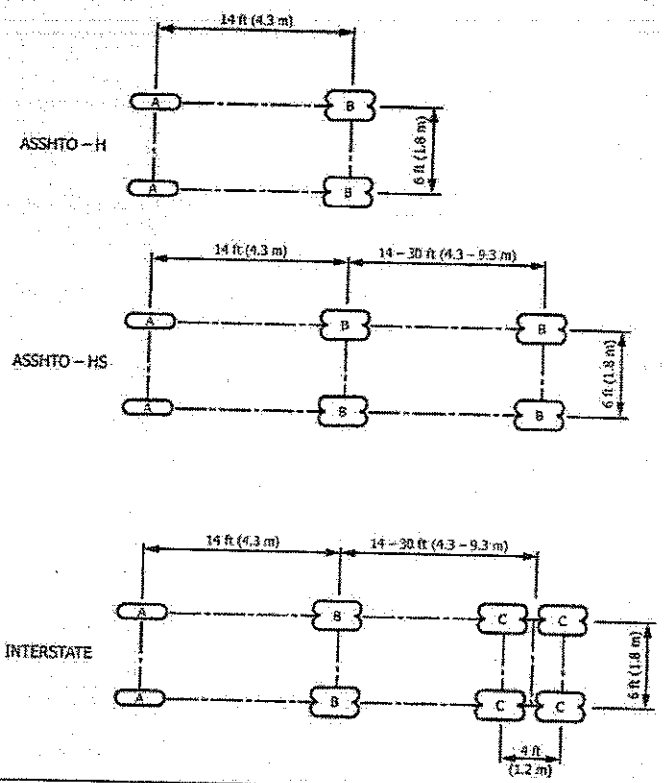
TABLE 1 Unit Weights of Materials

Material	Weight, lbf/ft^3 (N/m^3)
Concrete (plain or reinforced)	150 (23 600)
Lightweight Concrete (reinforced)	100 to 130 (15 700 to 20 400)
Cast Iron	450 (70 700)
Steel	490 (77 000)
Aluminum	175 (27 500)
Earth Fill	100 to 150 (15 700 to 23 600)
Macadam	140 (22 000)

TABLE 2 Vehicle and Pedestrian Load Designations

Designation	Load, max	Uses
A-16 (HS20-44)[A]	16 000 lbf (71 200 N) per wheel	heavy traffic
A-12 (HS15-44)[A]	12 000 lbf (53 400 N) per wheel	medium traffic
A-8 (H10-44)[A]	8 000 lbf (35 600 N) per wheel	light traffic
A-03	300 lbf/ft^2 (14 400 Pa)	walkways

[A] The designations in parentheses are corresponding ASSHTO designations.



Designation	Load at A		Load at B		Load at C	
	lbf	N	lbf	N	lbf	N
A-16 (HS20-44)[A]	4 000	17 800	16 000	71 200	12 000	53 400
A-12 (HS15-44)[A]	3 000	13 300	12 000	53 400	8 000	35 600
A-8 (H10-44)[A]	2 000	8 900	8 000	35 600	6 000	26 700

[A] The designations in parentheses are corresponding ASSHTO designations.

FIG. 1 Single Vehicle Traffic Loads and Spacing

5.2.3.4 When the dimensions of the distributed load area or the composite distributed load area exceed the top surface area of the structure, only that portion of the distributed load within the top surface area will be considered in the design.

5.2.4 The effects of impact will increase the live wheel loads designated as A-16, A-12, and A-8 as shown in Table 3.

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JEFFREY J. SWARTZ, PE, LEED AP
585 B AND T LANE
TAYLORSVILLE, NORTH CAROLINA 28681

May 19, 2016

Dean & Sheri Rossi
276 Milford Circle
Mooresville, NC 28117

Re: Unpermitted Addition Evaluation
Septic Tank Setback Encroachment Evaluation
276 Milford Circle
Mooresville, NC 28117
Job Number: 2016-20

Dear Mr. & Mrs. Rossi:

This letter has been prepared in response to your request to have a building and structural evaluation of an unpermitted addition to your home at the referenced address above. Also requested was an evaluation of the addition's encroachment within the required septic tank setback. The evaluation was performed on April 18, 2016. The weather was sunny with an outdoor temperature of approximately 75 degrees. This letter is in response to your request to identify any building and structural concerns or deficiencies with the unpermitted addition and the encroachment within the septic tank setback. The following is an opinion and all observations are based upon conditions at the time of inspection and only those areas visibly accessible. This is a general evaluation and does not include a forensic evaluation for damage caused by water, insects, or other items requiring demolition for observation. My observations are as follows:

ITEM 1: Unpermitted Addition
The unpermitted addition consists of unheated space used for storage, a bathhouse, and exterior shower. The water supply lines are insulated and have shut-offs. The electrical appears to be properly installed with GFIC receptacles for wet locations. The plumbing has the proper shut-offs, traps, and cleanouts. No interior or exterior cracks were observed. The wood ceiling of the bathhouse has some white residue on it. I notified the homeowner to continue observation of it. It did not appear to be a leak in the roof. The residue may be a salt effervescence leaching from the stucco. The residue may be cleaned to see if it returns.

The addition appears to have been constructed in accordance with standard building practices and in accordance with the North Carolina Residential Building Code, with the exceptions of not obtaining a building permit and the encroachment within the required septic tank setback.

Recommendation: The unpermitted addition to the home is structurally adequate and does not appear to have a negative impact on health and safety. No modifications are necessary.

ITEM 2: Septic Tank Setback Encroachment
Field measurements were obtained to approximately locate the septic tank and its depth. According to the owner, the unpermitted addition is located adjacent to a 1500 gallon concrete septic tank. According to the owner, a septic company probed the location of the tank and field marked the corner. Based on the typical dimensions of a 1500 gallon septic tank (see reference), the tank is offset from the largest load of the unpermitted addition by approximately 14 inches. The amount of soil covering the lid of the tank is approximately 34 inches. A typical non-traffic rated septic tank has a maximum lid loading rate of 500 pounds per square foot (psf) (see reference). A load analysis was completed based upon an estimated soil weight (see plan) and the influence weight from the unpermitted addition (see calculations). A calculated maximum load of 419 pounds per square foot

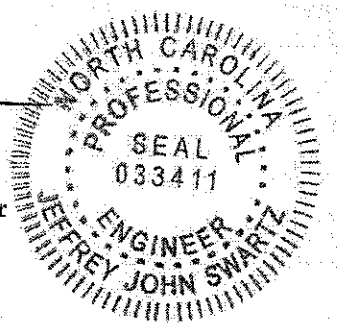
on the tank was obtained. This load would only be present along the corner edge of the tank and not over the entire lid. It should also be noted that the calculations assumed this load is with 7 to 8 inches instead of 14 inches. This increases the safety factor as well. Floor loads where excluded since they bear directly on the soil.

Recommendation:
The analysis referenced above assumed a septic tank lid load rating of 500 psf (see reference). If this assumption is correct, then the location of unpermitted addition adjacent to the existing septic tank does not pose a negative impact on health and safety. Based on an assumed a septic tank lid load rating of 500 psf the tank would not warrant relocation based on the structural analysis.

Let me know if you have any questions regarding the observations and recommendations mentioned above. Please do not hesitate to call me at (828) 632-0499.

Sincerely,

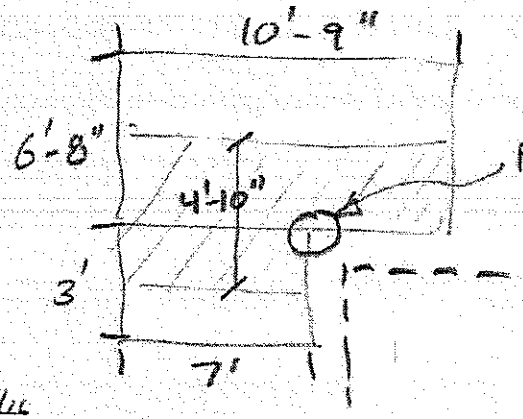
Jeffrey J. Swartz
Professional Engineer

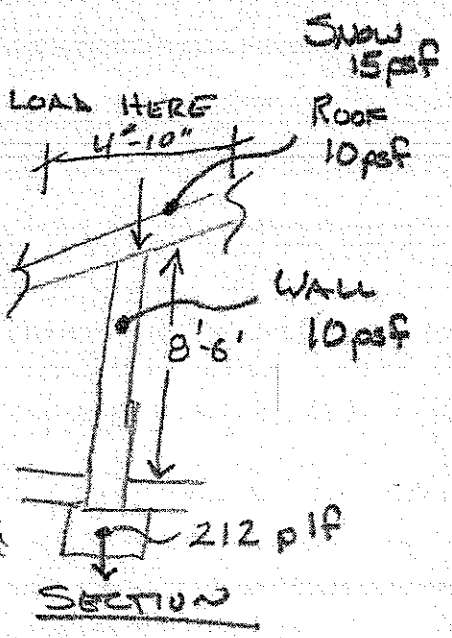


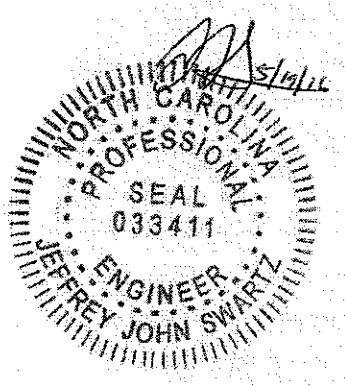
4/18/16

Rossi Load Calculations

UPDATED 5/19/16







Backfill
Assumed
100 pcf

Load Sum

4.8'(10+15) = 120 plf (Roof)

8.5'(10) = 85 plf (Wall)

212 plf (Slab/Footing)

417 plf ← load distributed over 3.5'

UPDATED FROM PREVIOUS #

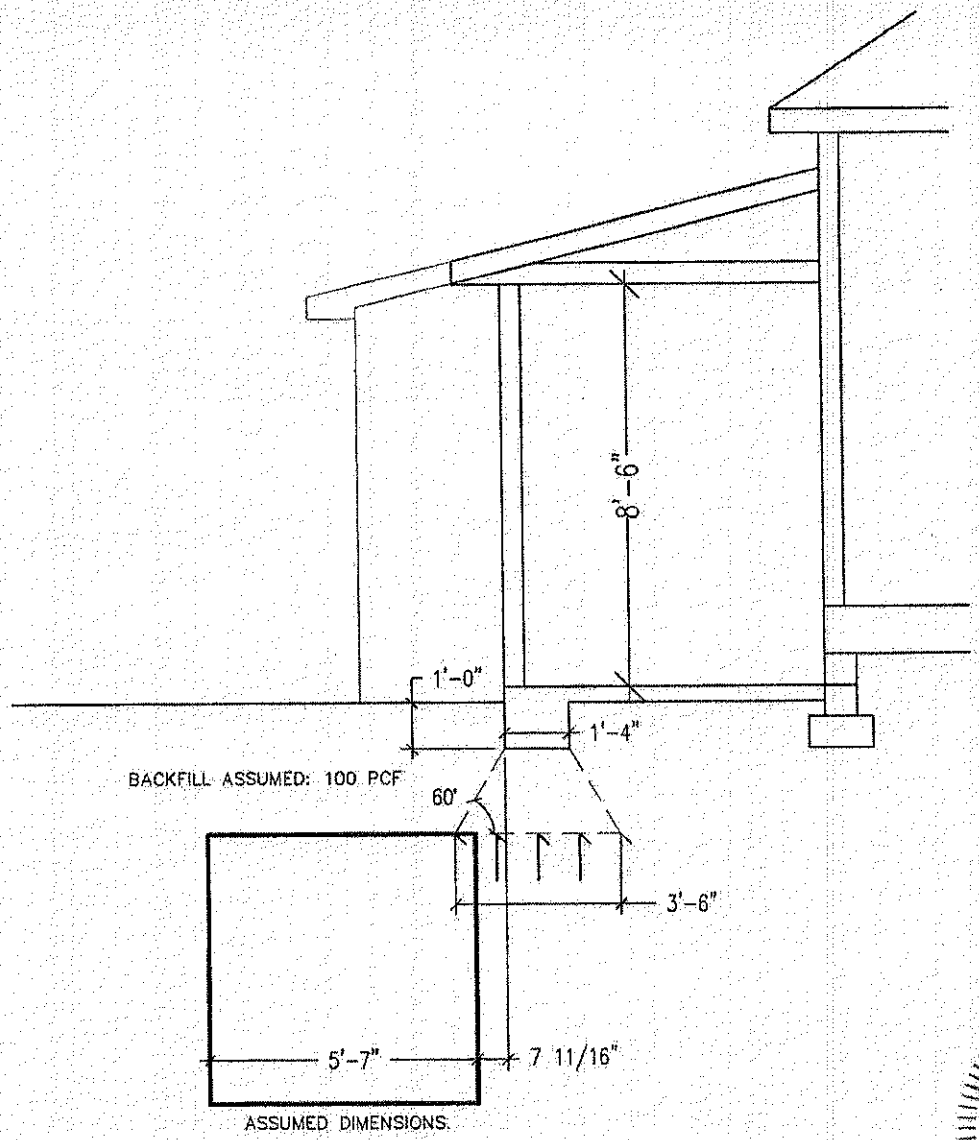
$\frac{417}{3.5}$ = 119 psf

Soil = 100psf × 3' = 300 psf

419 psf load on Tank wall < 500psf

Very little load on tank lid

Weight of materials from Building Const. Illustrated.



ASSUMED DIMENSIONS.

SECTION VIEW

SCALE: 1/4"=1'-0"

5/19/16

NORTH CAROLINA PROFESSIONAL SEAL 033411 ENGINEER JEFFREY JOHN SWARTZ

SHEET NO.: 2 OF 2

PROJECT NO.: 2016-20

05/19/2016

MANAGER:

DESIGN BY: JS

CHECKED BY: JS

DRAWN BY: JS

CHECKED BY: JS

CLIENT/OWNER

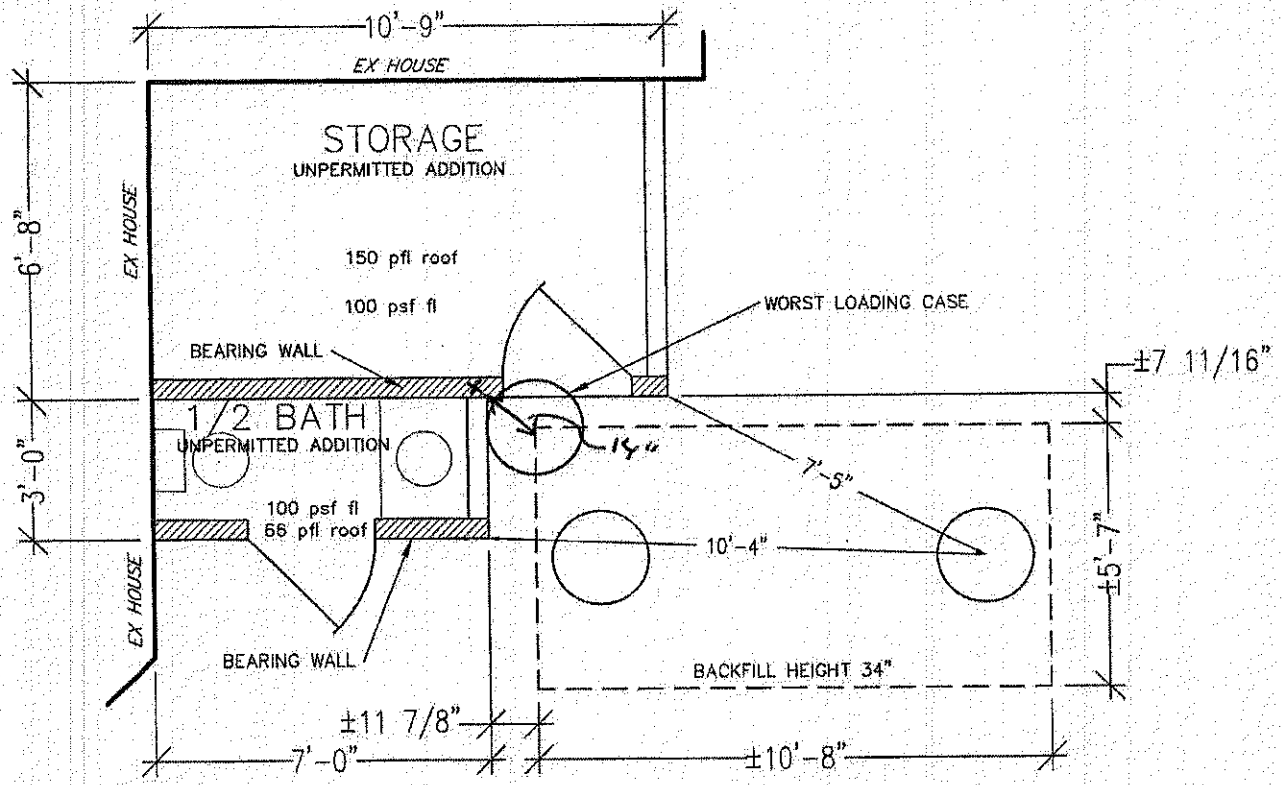
DEAN & SHERI ROSSI
276 MILFORD CIRCLE
MOORESVILLE, NC 28117
631-343-9416

SCALE AS NOTED

PLANS PREPARED BY:
JEFFREY JOHN SWARTZ, PE
585 BERT LANE
TAYLORSVILLE, NORTH CAROLINA 28681
(828) 632-0499
NC LICENSE NO.: 033411

SHEET TITLE

SEPTIC TANK / FOUNDATION ANALYSIS



ABOVE GRADE DIMENSIONS BASED UPON FIELD MEASUREMENTS.

PLAN VIEW

SCALE: 1/4"=1'-0"

5/19/16

NORTH CAROLINA PROFESSIONAL SEAL 033411 ENGINEER JEFFREY JOHN SWARTZ

SHEET NO.: 1 OF 2

PROJECT NO.: 2016-20

05/19/2016

MANAGER:

DESIGN BY: JS

CHECKED BY: JS

DRAWN BY: JS

CHECKED BY: JS

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SHEET TITLE

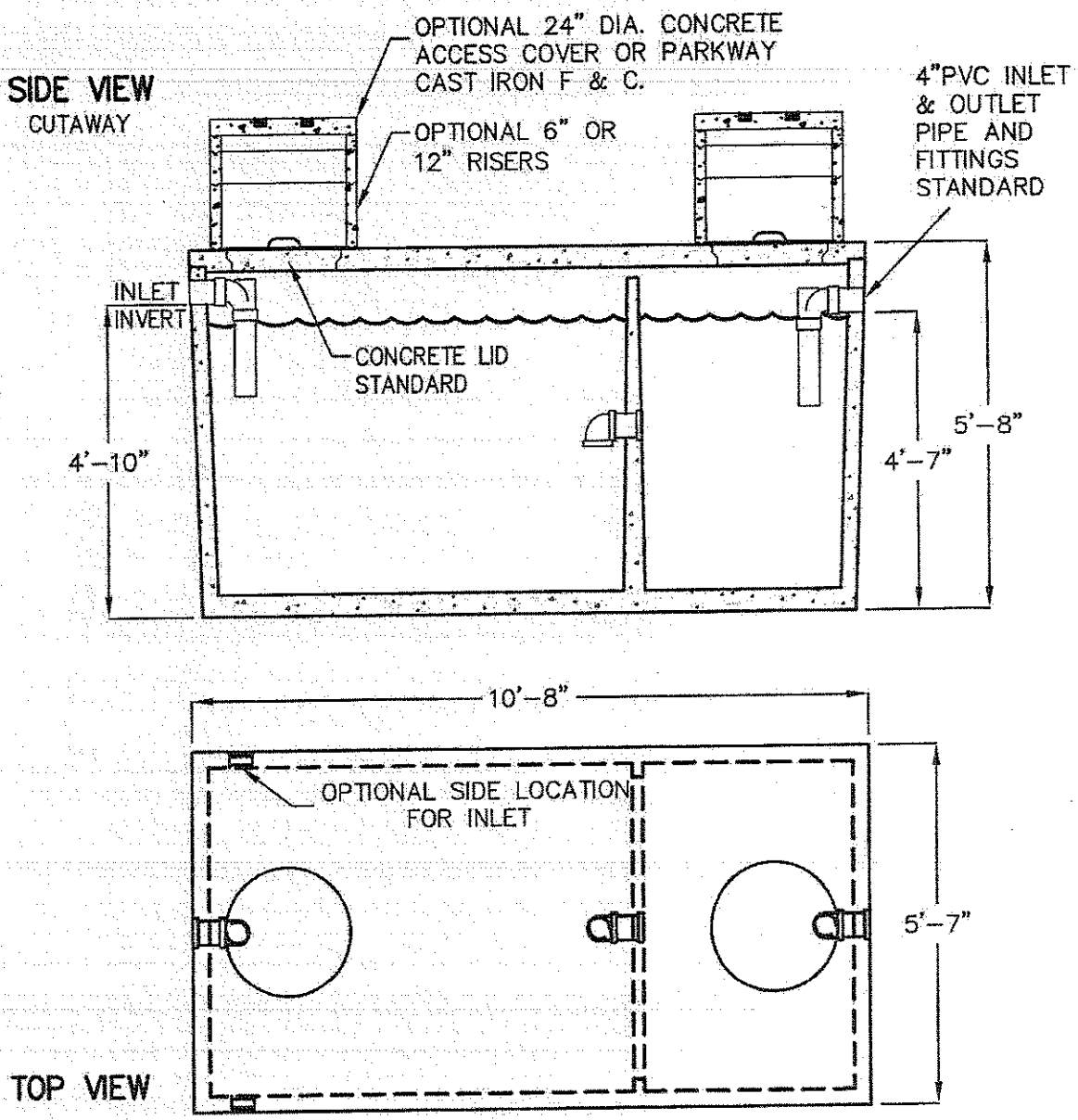
SEPTIC TANK / FOUNDATION ANALYSIS

FOR REFERENCE ONLY

1500 GALLON RESIDENTIAL SEPTIC TANK

MODEL JS1500

NON-TRAFFIC ACCEPTED BY **UPC**



- LIQUID CAPACITY: 1500 GALLONS
  TANK DESIGNED FOR NON-TRAFFIC USE WITH A MAXIMUM LOAD OF 500 PSF AND DRY SOIL CONDITIONS (WATER TABLE BELOW TANK). EARTH COVER OVER TANK NOT TO EXCEED 3'.
- THE PRECAST CONCRETE TANK SHALL BE PLACED ON LEVEL, UNDISTURBED SOIL OR APPROVED COMPACTED FILL.
- EFFLUENT FILTERS ARE AVAILABLE UPON REQUEST.
- FOR COMPLETE DESIGN AND PRODUCT INFORMATION CONTACT JENSEN PRECAST.

MINIMUM EXCAVATION SIZE:
6'-7" X 11'-8" X DEPTH REQ'D.

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10-01-03
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