GENOA CHARTER TOWNSHIP
Special Land Use Application

This application **must** be accompanied by a site plan review application and the associated submittal requirements. (The Zoning Official may allow a less detailed sketch plan for a change in use.)

APPLICANT NAME & ADDRESS: Paula Vanderkarr
Submit a letter of Authorization from Property Owner if application is signed by Acting Agent.

APPLICANT PHONE: (989) 277-1864 EMAIL: pvanderkarr@gmail.com

OWNER NAME & ADDRESS: Lula, LLC. (Lou Lucaj) 28715 Hovey Ln. New Hudson, MI 48165

SITE ADDRESS: 3557 E Grand River Ave. Howell, MI 48843 PARCEL #(s): 4711-05-300-006

OWNER PHONE: (248) 798-6226 EMAIL: loulucaj@gmail.com

Location and brief description of site and surroundings:
This site was used as banquet hall in the 1980's to mid 2000's. Then was brief home for for teenage kids to hang out on Friday and Saturday nights. To the west sets the empty Pier 1 building and behind that a set of office buildings housing everything from beauty shop ,chiropractic center, Perspectives Therapy Services,Clear Strategy and to the east Payless Shoe store, and the Grand River plaza, and across the road Discount Tire

Proposed Use:
The space will be used as an indoor dog day care with supervised play groups, Boarding and Training and in a year or so we will be grooming and bathing dogs and cats

Describe how your request meets the Zoning Ordinance General Review Standards (section 19.03):

a. Describe how the use will be compatible and in accordance with the goals, objectives, and policies of the Genoa Township Comprehensive Plan and subarea plans, and will promote the Statement of Purpose of the zoning district in which the use is proposed.

Retail shopping is getting harder to lease with the fact you can order just about anything online and have it delivered right to your door so in comes service related business like Doggie Day Care, Boarding for both cats and dogs, and Training. By re purposing this building we are not altering the exterior but cleaning it up and keeping it maintained with the natural tree lines that are there and controlling urban sprawl. This site works in accordance to zoning 7.02.02 (W)

b. Describe how the use will be designed, constructed, operated, and maintained to be compatible with, and not significantly alter, the existing or intended character of the general vicinity.

There will not be significant alteration to the exterior of the building other than updating lighting fixtures on the outside and painting any exposed wood and cleaning up over grown weeds and trash in the parking lot and re stripping parking spot. A white 6' vinyl fence will be add to the back of the building so the dogs in small supervised go out and play and go to the bathroom. The out side area will have K-9 grass installed that allow urine to filter thru and become water and will not get into the drinking water and any solid waste will be picked up promptly and disposed in a lined trash can.

c. How will the use be served adequately by essential public facilities and services such as highways, streets, police and fire protection, drainage structures, water and sewage facilities, refuse disposal and schools?

The police and fire protect will remain the same service as provided for the current existing building.
There is not a need for drainage structures and city and sewer services are currently provided to the existing building.
There will be a need for a medium dumpster that will be used for trash and to dispose of solid waste from the dogs and cats.

d. Will the use involve any uses, activities, processes, or materials potentially detrimental to the natural environment, public health, safety, or welfare by reason of excessive production of traffic, noise, vibration, smoke, fumes, odors, glare, or other such nuisance? If so, how will the impacts be mitigated?

There are only two items I can think that could be a nuisance is noise from barking dogs from the outside play area and it will be mitigated by only having 15 dogs in the outside play area that are supervised and if there is a dog that has a barking problem the will promptly brought inside. The inside of the building will be adequately sound proof in accordance to the zoning in section 7.02.02 (W-3). All other zoning ordinances in section 7.02.02 (w) will be followed to insure the public safe and wellbeing of the community.

e. Does the use have specific criteria as listed in the Zoning Ordinance (sections 3.03.02, 7.02.02, & 8.02.02)? If so, describe how the criteria are met.

This property meets all the criteria and here is how. Hours of operation to the public will be 7am to 7pm, we will not have any individual outdoor dog runs,we will make sure the soundproofing of the building is adequate to meet and exceed the zoning requirement, the number of dogs will not exceed (1) pet per (100) square feet of gross floor area, length of stay will be limited to 14 consecutive days . Cleaning measures will be implemented to insure odor control both inside and out, the outdoor area will will be made of white vinyl 6' tall and K-9 grass and will be 300 ft away from nearest residential use. No more the 15 dogs will be in outdoor play area with supervised .

I HEREBY CERTIFY THAT ALL INFORMATION AND DATA ATTACHED TO AND MADE PART OF THIS APPLICATION ARE TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF. I AGREE TO DESIGN, CONSTRUCT AND OPERATE, AND MAINTAIN THESE PREMISES AND THE BUILDINGS, STRUCTURES, AND FACILITIES WHICH ARE GOVERNED BY THIS PERMIT IN ACCORDANCE WITH THE STATED REQUIREMENTS OF THE GENOA TOWNSHIP ZONING ORDINANCE, AND SUCH ADDITIONAL LIMITS AND SAFEGUARDS AS MAY BE MADE A PART OF THIS PERMIT.

THE UNDERSIGNED Lou Lucaj STATES THAT THEY ARE THE FREE OWNER OF THE PROPERTY OF PROPERTIES DESCRIBED ABOVE AND MAKES APPLICATION FOR THIS SPECIAL LAND USE PERMIT.

* BY: _____

ADDRESS: 3557 E Grand River Ave Howell, Mi. 48843

Contact Information - Review Letters and Correspondence shall be forwarded to the following:

Paula Vanderkarr of Dog Town & Kitty City, LLC at pvanderkarr@gmail.com
Name Business Affiliation Email

FEE EXCEEDANCE AGREEMENT

As stated on the site plan review fee schedule, all site plans are allocated two (2) consultant reviews and one (1) Planning Commission meeting. If additional reviews or meetings are necessary, the applicant will be required to pay the actual incurred costs for the additional reviews. If applicable, additional review fee payment will be required concurrent with submittal to the Township Board. By signing below, applicant indicates agreement and full understanding of this policy.

SIGNATURE: Paula Vanderkarr DATE: 7/31/2018

PRINT NAME: Paula Vanderkarr PHONE: 989-277-1864

Revised 08-15-13, kasp

GENOA CHARTER TOWNSHIP
Application for Site Plan Review

TO THE GENOA TOWNSHIP PLANNING COMMISSION AND TOWNSHIP BOARD:

APPLICANT NAME & ADDRESS: Paula VanderKarr 7692 Badger Ct. Howell mi. 4884
If applicant is not the owner, a letter of Authorization from Property Owner is needed.

OWNER'S NAME & ADDRESS: Lou Lucaj 28715 Hovey LN. New Hudson M. 48

SITE ADDRESS: 3557 E Grand River Ave PARCEL #(s): 4711-05-300-016

APPLICANT PHONE: (989) 277-1864 OWNER PHONE: (248) 798-6226

OWNER EMAIL: loulucaj@gmail.com / Applicant: pvanderkarr@gmail.com

LOCATION AND BRIEF DESCRIPTION OF SITE:

This site used to Be the home of the K of C and there are two Building on this property The front Building was where they held thier Meetings and the Back was a Banquet Hall I'm Looking to lease the Banquet Hall.

BRIEF STATEMENT OF PROPOSED USE:

I am Looking to open a Doggie day care, w/group play, training and Boarding and down the road do ~~Sta~~ grooming We want to be part of this Community and help educate pet owne on the Responsabilty of Pet ownership

THE FOLLOWING BUILDINGS ARE PROPOSED:

We would like to lease the back building that was used as the Banquet Hall

I HEREBY CERTIFY THAT ALL INFORMATION AND DATA ATTACHED TO AND MADE PART OF THIS APPLICATION IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

BY: Paula VanderKarr

ADDRESS: 3555 E Grand River Ave Howell Mi. 48843

Contact Information - Review Letters and Correspondence shall be forwarded to the following:

1.) Paula VanderKarr of Dog Town & Kitty City, LLC. at pvanderkarr@gmail.com
Name | Business Affiliation | E-mail Address

FEE EXCEEDANCE AGREEMENT

As stated on the site plan review fee schedule, all site plans are allocated two (2) consultant reviews and one (1) Planning Commission meeting. If additional reviews or meetings are necessary, the applicant will be required to pay the actual incurred costs for the additional reviews. If applicable, additional review fee payment will be required concurrent with submittal to the Township Board. By signing below, applicant indicates agreement and full understanding of this policy.

SIGNATURE: Paula VanderKarr DATE: 7/31/2018

PRINT NAME: Paula VanderKarr PHONE: 989-277-1864

ADDRESS: 7692 Badger Ct. Owosso, Mi. 48867

June 6, 2018

Genoa Township – Michigan
Attn. Planning/Zoning
2911 Dorr Road
Brighton, MI 48116

RE: Use Application in favor of Paula VanderKarr (Dog Town & Kitty City)
For 3557 E. Grand River, Howell, Michigan.

To Whom it May Concern:

The undersigned is an authorized signatory of Lula, LLC, the owner of that certain parcel of real property commonly known as 3557 E. Grand River, Howell, Michigan. Paula VanderKarr is the Tenant of the property pursuant to a Lease Agreement.

This letter will confirm that Lula, LLC, has authorized Paula VanderKarr and her consultants to apply for and, obtain the necessary governmental approvals to permit Dog Town & Kitty City to operate its business at the referenced location.

Sincerely,

Lula, LLC

Lou Lucaj
Managing Partner

GENOA CHARTER TOWNSHIP
PLANNING COMMISSION
PUBLIC HEARING
September 10, 2018
6:30 P.M.
MINUTES

CALL TO ORDER: The meeting of the Genoa Charter Township Planning Commission was called to order at 6:30 p.m. Present were Chairman Doug Brown, Jim Mortensen, Chris Grajek, Marianne McCreary, Eric Rauch and Jill Rickard. Absent was Jeff Dhaenens. Also present was Kelly VanMarter, Community Development Director/Assistant Township Manager,Gary Markstrom of Tetra Teach, Brian Borden of Safebuilt Studio, and an audience of 24.

PLEDGE OF ALLEGIANCE: The pledge of allegiance was recited.

APPROVAL OF AGENDA:

Moved by Commissioner McCreary, seconded by Commissioner Mortensen, to approve the agenda as presented.

CALL TO THE PUBLIC: The call to the public was made at 6:31 pm with no response.

OPEN PUBLIC HEARING # 1… Review of special use, site plan, and environmental impact assessment for the re-use of an existing commercial building for a proposed pet day care for Dog Town - Kitty City. The property in question is located at 3557 E. Grand RIver Avenue, Howell. The request is petitioned by Paula Vanderkarr.

A. Recommendation of Special Use Application
B. Recommendation of Environmental Impact Assessment
C. Recommendation of Site Plan

Mr. Brian Biskner with Powell Engineering and Ms. Paula Vanderkarr were present. Mr. Biskner provided a review of the business and showed the proposed site plan and fencing material samples. They will be using canine grass in the dog area. The stone underneath the artificial grass allows the liquid waste to filter more quickly into the ground. The solid waste will be collected and placed into trash containers.

They are asking for relief with some of the landscaping requirements. They are hoping to use the existing vegetation in the rear of the property to meet the requirements. This area is already quite dense. They are not proposing any landscaping along the east and west property lines as. they would like to use the existing vegetation in that area also.

There was a discussion regarding the material that will be below the area where the canine grass will be placed and how it will properly filter the pet waste. Mr. Biskner stated the stone that will be under the grass will be the primary location that will trap the bacteria from the liquid waste. Ms. Vanderkarr has spoken to the canine grass company and they advised that 95% of pet waste is water and 5% is protein and other waste.

Commissioner Rickard would like to see additional engineering done to ensure that the bacteria from the pet waste will not enter into the storm sewer system.

Mr. Borden reviewed his letter dated August 29, 2018. The general special land use standards are met; however, with regard to the use standards, the following is still required:

- A noise impact study shall be done

Ms. Biskner stated that the sound study has not been completed at that time. She anticipates it being done within a week to 10 days. Commissioner Mortensen stated he will not vote for a recommendation for approval without the sound study being provided to the Planning Commission.

- The proposed fence does not match the existing building so the applicant will need to explain why the proposed fence is compatible with the building.

Commissioner Rauch believes the type of fence required could be determined by the sound study. Perhaps a masonry wall would be more appropriate. Commissioner Mortensen agrees and stated that if that is the case, he would like to see a rendering of the wall.

- Approvals from outside agencies are needed

Mr. Borden stated these approvals are typically obtained after approval by the Township Board.

Since writing his letter, the applicant provided parking details. They are proposing some parallel parking. He would like to see these spaces marked as “Employee Only” and have the patrons use the other parking spaces. He would also like to have the handicap accessible space relocated.

Additional comments from Mr. Borden’s letter are:

- The parking lot pavement should be repaired / improved
- Landscape improvements shall be made. He noted that a revised plan with additional landscaping has been provided; however, he has not been able to review it in detail as of yet.
- The existing floodlights must be removed
- The existing, non-conforming pole sign should be removed and replaced with a ground sign. Because the applicant is not the property owner, she would not be responsible for replacing the sign. Commissioner Mortensen would like the property owner to be required to replace the sign.

Mr. Markstrom reviewed his letter dated August 28, 2018.

- The existing well should be abandoned to ensure there is no cross-contamination with the municipal water supply
- The private sanitary lead between the two buildings and grinder pump are not shown
- The private water lead between the buildings should be shown on the plans

There are no major changes being made to the site and some of the impervious surface is being removed, by removing the asphalt and installing the canine grass. He agrees with Mr. Borden that if pavement issues exist, it should be repaired.

Chairman Brown reviewed the Brighton Area Fire Authority's letter dated September 5, 2018. They are requiring an additional fire hydrant on the site. They also have concerns with the parking spaces.

The Call to the Public was made at 7:29 pm.

Ms. Stephanie Dallakian owns the building directly west of the building in the front of this building. That building's elevation is higher than the buildings to the west. She questioned how the runoff will be controlled. She would like to have landscaping around the fencing.

Mr. Steve Seek of 3536 Snowden Lane is concerned with the sound and the smell from this use. He questioned if the dogs will be left outside alone for a long time.

Mr. Robert Peterson of 3429 East Grand River, which is two properties away from this site, stated there is natural drain in his backyard. He questioned if animals will be left overnight.

Mr. Jim Strand of 3445 Dewdrop Lane is concerned with the waste from the pets. He does not believe it will be cleaned in the winter time. The evaporation of the liquid waste will put the bacteria into the air and that will attract bugs. Those bugs will transport that bacteria into the neighborhoods. He is also concerned with the noise.

The call to the public was closed at 7:46 pm.

There was a discussion about having a small canine grass area in the front of the building for dogs that need to relieve themselves when they are being dropped off or picked up.

Moved by Commissioner Mortensen, seconded by Commissioner McCreary, to table the request from Paula Vanderkarr until the October 9, 2018 Planning Commission meeting. **The motion carried unanimously**.

OPEN PUBLIC HEARING #2… Review of sketch plan for the re-use of an existing commercial building for a proposed retail thrift store located at 2700 E. Grand River Avenue, Howell. The request is petitioned by Volunteers of America.

A. Disposition of Sketch Plan

Brent LaVanway of Bross Engineering, Alex Brodrick and Brian Wilbur of Volunteers of America and Jeff Peltier, the architect, were present.

Mr. LaVanway reviewed the project and showed the site plan and colored renderings of all elevations. They will be repaving the parking lot, adding pavement to the rear of the building to accommodate more parking space, adding a sidewalk along Grand River, and adding landscape islands in the parking lot.

Mr. Brodrick provided a history of Volunteers of America and explained what services they provide.

Mr. Borden reviewed his letter of August 30, 2018. The following ordinance requirements must be met:

- The rear parking setback does not meet the requirements; however, the Planning Commission can waive that requirement because there is a shared access driveway.

Impact Assessment

For
Dog Town and Kitty City, LLC

Applicant:
Paula Vanderkarr
3557 East Grand River Avenue
Howell, Michigan 48844
989-277-1864

Prepared by:
Paula Vanderkarr
In conjunction with property information provided by:
Powell Engineering & Associates, LLC
4700 Cornerstone Drive, White lake, Michigan 48383
Brian Wiggins, Architect
11315 San Jose, Redford, Michigan48239

July 30, 2018

Revised October 23, 2018

Introduction

This impact assessment has been prepared pursuant to Article 1.3 – Site Plan Review and Impact Assessment of Special Land Use for the Township of Genoa, Livingston County, Michigan. The assessment address the impact of the proposed internal construction of the existing 6,312 square foot commercial building at 3557 East Grand River Avenue.

a. Name(s) and address(es) of person(s) responsible for preparation:
Paula Vanderkarr, 3557 East Grand River Avenue, Howell, Michigan. Owner of Dog Town and Kitty City, LLC. This impact assessment has been prepared in conjunction with property information provided by
Powell Engineering, LLC
4700 Cornerstone Drive, White Lake, MI 48383
Miss Dig
Garlock – Smith Land Surveying
516 E Grand River Ave, Howell MI 48844

b. Map(s) and written description/analysis of the project site:
The existing building, pending approval on special use permit, located at 3557 East Grand River Avenue, is located behind the Knights of Columbus building and was their rental Banquet Hall for the past three decades. The building will be renovated in preparation for a pet boarding, daycare and training with grooming to be added at a later date. The site is on 2.83 acres, set back 312 feet from a residential area to the north. To the east is the Grand River Plaza Mall and to the west is the vacant Pier One Imports building. Behind these buildings are a dentist office, a hair salon and multiple small businesses. To the south is Payleess Shoe Store.
-An aerial photograph is provided for your review.

c. Impact on natural features:
This is not applicable, as the proposed project is for the build out of the interior of a leased space in the existing building.

d. Impact on storm water management:
This is not applicable, as the proposed project is for the build out of the

interior of a leased space in the existing building and a small exterior play area. In accordance to section 7.02.02(w) of the draft Ordinance Amendment, I have provided a sight plan and photographs of the proposed dedicated outdoor dog run area.
K9 Grass will be placed on a base of 'aggregated washed limestone and sand. This will decrease amount of water runoff.Urine is mostly water (about 95% water) the remaining consists of urea, uric acid, ammonia, hormones, dead blood cells, proteins, salts and minerals, and toxins from their bodies. The purpose of the sand and the washed crushed aggregated limestone acts like a filter. Feces will be promptly picked up and discarded in a waste contained outside the building which will be emptied by the waste collection company. The arrangement for these collections will be made by Dog Town & Kitty City pending approval of the special use permit. According to people who have worked in daycare and boarding place around 60 dogs produce ½ to ¾ of a 5 gallon pail of solid waste. Cat waste will be put in trash cans lined with trash bag.
Trash bags and will be taken to the trash cans outside on a daily routine. Housing 8 cats for 7 days might produce around 10 gallons of waste. If the two 96 gallon trash cans are not adequate for weekly pick up multiple picks will be arranged.
AT NO TIME WILL DOG OR CAT WASTE INCLUDING KITTY LITTER WILL BE ALLOWED DOWN THE SEWER DRAINS..

Impact on surrounding land used:
Noise is the potential impact on surrounding properties. The following methods for noise attenuation include:
1) Absorption – Panels will be hung on walls to absorb noise
2) Isolation – Provides a noise barrier. Spray foam, staggering 2x4s with insolation in between, rubber matting can be placed between the dry wall and insolation.
3) Masking – Calming music will be played throughout the facility to keep dogs from barking. Combing essential oils and pheromones can also be used with the calming music, to keep noise down inside the business.
4) fiberglass insulation, soundproofing clip, drywall furring channel, then two layers of 5/8 drywall.

There is a dense canopy of trees behind the building that combined with my proposed noise solutions, will adequately reduce any noise.

Potential for air pollution and waste nuisance can be managed by adding cedar chips to mask the smell of the feces. This method, combined with scheduled waste pick up, along with disinfecting and cleaning protocols, will adequately prevent of any potential air pollution.

The proposed business is consistent with the development of adjacent properties. Growth along the Grand River Avenue corridor has consisted of a mixture of medical, office and commercial uses.

e. Impact on public utilities:
The property is presently supplied by municipal sewer and water systems. The construction is limited to the interior of the existing building, so impact on public utilities will be minimal. After construction, there will be minimal impact on public utilities from the proposed business. According to Miss Dig, my proposed outdoor K9 Grass will not interfere with the city sewer and water systems.

f. Storage and handling of any hazardous materials:
Not applicable.

g. Impact on Traffic and Pedestrians:
The business is located in the site on Grand River Avenue, west of Latson Road, east of Grand Oak Drive. Access to the site will be through the existing driveway, located at the south site of the property. Grand River Avenue at this location is a four lane road with a left turn center lane.

Weekday peak hours will be from 7:00 a.m. -8:30 a.m. and 4:00 pm – 7:00 p.m. The proposed business hours are 7:00 am – 7:00 p.m., seven days a week.
This building is 6,312 square feet which bring my total animal capacity to 63. On average we expect to have 40 dogs and cats regularly and holidays at capacity.
How that relates to traffic in and out 45% will be picks ups to and from hospitals for hospital employee's pets using a climate controlled trailer. Then 35% would be for commuters traveling to work and dropping off their dogs for daycare and picking up on their way home. The last 20% boarded animal which will be dropped off and left for multiple days.
On most given days saying we have 40 dogs, we would be picking up 18 dogs with one trip in and one trip out. Drop off by commuters would be 14 dogs with 14 drop offs in the morning and 14 pick up at night. As for boarding I would add 3 drop offs and 3 pick up every other day. So in reality this about 17 drop offs and 17 pickups.
Three days a week from 5:45 pm to 6:45 pm will have for training classes. On the weekends training will be scheduled for none peak times 10 am to 12pm with about 10 dogs per class.

h. Special Provisions:

No special provisions or requirement are currently proposed for this facility.

i. List of sources:

Brian Wiggins, Architect
11315 San Jose, Redford, Michigan 48239
eNoise Control
297 North 9th Street, Noblesville, Indiana 46060
Garlock-Smith, Land Surveying
516 East Grand River Avenue, Howell, Michigan 48844
LULA, LLC
28715 Hovey Lane, New Hudson, Michigan 48165
Powell Engineering & associates, LLC
4700 Cornerstone Drive, White Lake, Michigan 48383
Soundproofing Company, INC
HTTP://www.soundproofingcompany.com
Chelsea Storm worked in dog daycare 989-413-2731
Elizabeth Watling worked in dog daycare 989-627-7246

Soundscape Engineering
Practical Solutions from Professional Engineers

October 22, 2018

Paula Vanderkarr
989-277-1864
pvanderkarr@gmail.com

Dog Town & Kitty City, LLC
7692 Badger Ct.
Owosso, MI 48867

Subject: Dog Town & Kitty City, LLC – Acoustical Report

Dear Paula:

Soundscape Engineering LLC has performed tests and analysis for the Dog Town and Kitty City project site for sound isolation of the building envelope and ambient sound level. The recommendations are presented in this report.

Soundscape Engineering Credentials

Soundscape Engineering LLC is an engineering firm that provides sound and vibration measurement, assessment, and design consulting services. We do not sell any products or have affiliations with any product manufacturers, allowing us to provide an unbiased service to our clients and to recommend solutions that fit their needs. Our principal consultants hold engineering licenses in four States, including Michigan, and are Board Certified by the Institute of Noise Control Engineering. Please refer to Appendix A for further details about our company.

Background

The building at 3557 Grand River Road, Howell, Michigan will house a dog and cat daycare and boarding company. Genoa Township has a specific compliance requirements for dog daycare facilities. The Genoa Township Zoning Ordinance, 7.02.02 Use Conditions, (w) Pet Daycare Centers, paragraph (3) reads:

> *Walls, partitions and floor/ceilings assemblies separating dog daycare facilities from adjacent uses shall adequately soundproofed with a sound transmission class over sixty (60) and shall be constructed so that there will be no emission of noise detrimental to surrounding properties. The applicant shall provide a noise impact study performed by a certified acoustical engineer to ensure the noise levels produced by the pet daycare use will not exceed fifty (50) decibels above ambient noise at the outside of an exterior wall or at the opposite side of a common interior wall. The study shall also confirm compliance with the Township Noise Ordinance in regard to noise levels at the property line.*

Regarding property line limits, Section 4.0: Decibel Level Prohibitions of the Noise Ordinance reads:

> *No person shall conduct or permit any activity, including those specific prohibitions listing in section 3 that produces an OBA at or beyond the property line of the property on which it is conducted which exceeds the levels specified in Table I. Such noise levels shall be measured on the property line or on the adjacent property, which is receiving the noise. Where property is used for both residential and commercial purposes, the limitations set forth below for commercial property shall apply.*
>
> *Table I - Use of Property Producing Sound Use of Property Receiving Sound*
>
> *Residential to Residential - (75 db from 7:00am to 10:00pm and 50 db from 10:00pm to 7:00am.)*
>
> *Commercial to Residential - (80 db from 7:00am to 10:00pm and 50 db from 10:00pm to 7:00am.)*
>
> *Residential to Commercial - (80 db from 7:00am to 10:00pm and 50 db from 10:00pm to 7:00am.)*

The second condition, Commercial to Residential, applies at the north property line. All other receiving properties to the east, west and south are zoned commercial and therefore do not have a requirement.

The overnight area and indoor playroom have exterior walls on the north and west sides of the building.

We understand that sound from the outdoor dog walking area will be controlled by bringing barking dogs inside.

Demolition in the building included removing the interior gypsum board on the exterior walls in these areas. The studs are bare and no acoustical insulation is installed. This is the current condition of the building.

Terminology

Glossary of acoustical terminology is included in Appendix B in case you wish to refer to it while reading the report.

Instrumentation

A Larson Davis model 831 sound level meter with a PCB model 377B02 microphone was used for the sound level measurements described herein. The microphone, pre-amp, and sound level meter meet the requirements for a Class 1 instrument in accordance with IEC 61672 or ANSI S1.4. The sensitivity of the sound level meter was checked, in the field, before and after making the measurement reported herein. Sensitivity was checked using a Larson Davis model 250 handheld sound level calibrator conforming to the Class 1 requirements of IEC 60942 and ANSI S1.40.

Observations and Exterior Level Calculations

A site visit was made on September 20, 2018 to observe the building's current condition and measure the outdoor ambient sound level. North of the project site is a residential area, approximately 312 feet north of the project site. To the south, east, and west are commercial areas, shown in Figure 1. Sound level measurements were taken approximately 3:30am to capture the quietest ambient condition, which is the most stringent condition to meet. An ambient sound level of 44 dBA was measured outside the north facade. This is likely the quietest location near the building as the building itself acts as a barrier to traffic noise coming from Grand River. This was the dominant sound source during our measurements.

Figure 1: Site Aerial

Per the noise ordinance, the sound level due to the dog daycare cannot exceed 50 dB above the ambient noise. With a measured ambient of 44 dBA, this produces an allowable level of 94 dBA at the exterior wall. The daycare occupies the entire building and therefore the interior common wall requirement does not apply.

We recorded dog barking sound in a large reverberant space for a different facility and measured a maximum level of 102 dBA inside the building. With the recommended exterior partition at this site, the predicted level outside the exterior wall is 38 dBA, which is less than 94 dBA. The level at the north property line is predicted to be 11 dBA, which is less than the allowable 50 dBA. Both these levels comply with the Township regulation. Supporting calculations are provided in Appendix D.

To put these levels into perspective, a reference of common sound levels is provided in Table 1.

Table 1: Various noise sources and their approximate sound levels

Average, L_{eq}, Sound Pressure Level (dBA)	Noise Source
130	Threshold of pain
120	Loud rock band near loudspeaker
110	Train siren at 50 ft
100	Loud automotive horn at 10 ft
90	Subway train at 20 ft
80	Lawn mower at 10 ft
70	Boeing 757 aircraft cabin during flight
60	Conversational speech at 3 ft
50	Average open office background sound
40	Soft background music or Wind in trees (10 mph)
30	Average residence – no activity
20	Whisper
10	Human breathing
0	Threshold of hearing

Recommendations

Based on the current building construction, we recommend the following steps and materials to achieve the ordinance-required wall and roof rating of over STC 60. Refer to Figure 2 for each wall and ceiling type location. Supporting test data and calculations are provided in Appendix D.

Figure 2: Site Layout

Unmarked exterior walls do not need acoustical upgrading since the rooms do not house dogs and they serve as a buffer space between rooms with dogs and the exterior. The combination of interior wall, buffer space, and exterior wall will achieve the criteria of greater than STC 60.

Blue Walls – These walls border the overnight area, dog suites, and play areas. It our understanding the exterior shell consists of vinyl siding, plywood, 5/8" rigid insulation and 2"x4" wooden studs. To meet the ordinance, we recommended the addition of the following materials. In Figure 3, the vinyl siding and plywood are approximately acoustically equal to and in place of the pictured 5/8" gypsum board.

- Fill stud cavities with 3-1/2" fiberglass batt insulation.
- Install two (2) layers of 5/8" Type 'X' gypsum board on resilient clips. In the Indoor Play Areas, the gypsum board must extend to the Dierks/plywood layer.
  - Acceptable manufacturer is Kinetics Noise Control – IsoMax clips https://kineticsnoise.com/arch/isomax.html or equal.

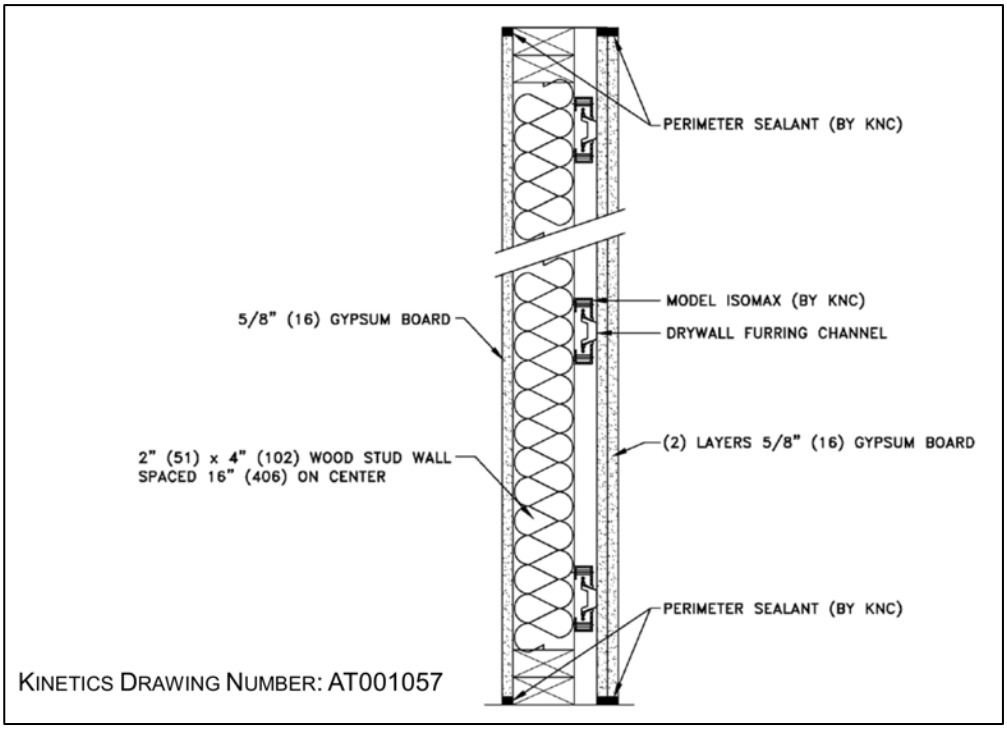

Figure 3: STC 61 Exterior Wall Construction

Orange Wall – This section of wall has metal siding in lieu of the exterior plywood sheeting, which does not perform as well acoustically. It is our understanding that the current construction consists of vinyl siding on profiled metal, both mounted to 2"x4" wooden studs. For this construction on the north wall, we recommend one of the following constructions:

- Exterior wall construction with resilient clips – Option 1
  - Infill the exterior stud side with a layer of 5/8" plywood or 5/8" gypsum board. Seal to the studs with acoustical caulk. The infill panels must extend up to the Dierks/plywood layer. See Figure 4.
  - Seal the exterior partition from the interior with acoustical caulk.
  - Fill the stud cavities with fiberglass batt insulation.
  - Mount two (2) layers of 5/8" Type 'X' gypsum board on resilient clips. This partition must extend to the Dierks/plywood layer.

- Exterior wall with double wall construction – Option 2
  - Erect a second row of studs spaced 5" from the existing studs to form a 12" cavity between the inside metal and gypsum board faces. The studs must extend to the Dierks/plywood layer.
  - Seal the exterior partition from the interior with acoustical caulk.
  - Fill the stud cavities with 10" fiberglass batt insulation.
  - Install three (3) layers of 5/8" Type 'X' gypsum board directly to the new stud row. This partition must extend to the Dierks/plywood layer.

- Install full perimeter seals for the door on the north side of Indoor Play Area "A". See Appendix C for specifics on the door and seals.

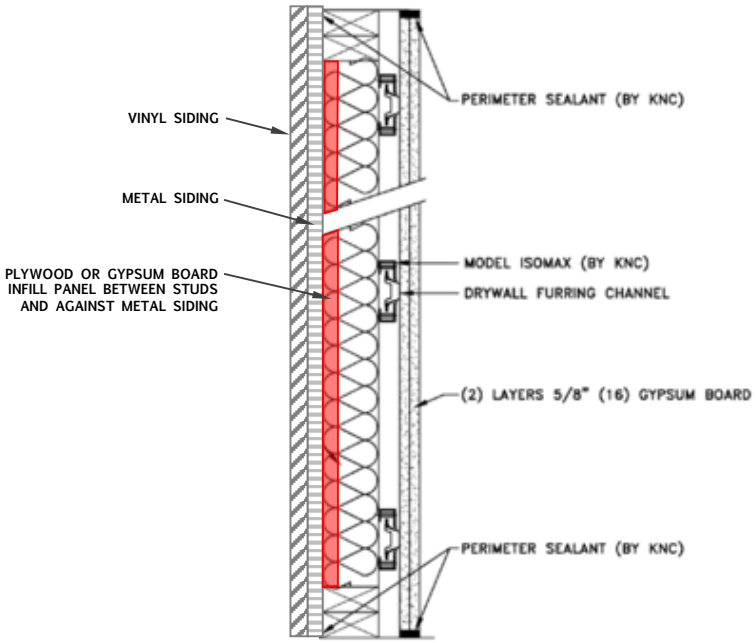

Figure 4: STC 61 Exterior Wall Construction

Refer to the General Notes about Methods and Materials section at the end of this report for typical notes and additional information about partition construction.

Indoor Play Area Ceiling/Roof - Green Shaded Area

Our calculations are based on the current construction, which is asphalt shingles, plywood deck, 1" blown in insulation, an additional layer of ½" plywood, insulation, and a 22" air space to the lay-in grid. We recommend the following upgrades to the construction to achieve an STC 61.

- Patch any holes larger than ¼" diameter that may exist through the existing plywood.
- Install an acoustical ceiling tile with a minimum CAC 35 into the existing lay-in grid.

Overnight Area Ceiling/Roof – Peach Shaded Area

Our calculations are based on the current construction, which is asphalt shingles, plywood deck, insulation, and one layer of gypsum board attached directly to the ceiling joists. We recommend the following upgrades to the construction.

- Install two (2) layers of 5/8" Type 'X' gypsum board on resilient clips over the existing gypsum board. Insert 1" batt or board fiberglass insulation between the existing and new layers of gypsum board. Do not use fasteners for the fiberglass that will bridge between the existing and new layers of gypsum board. This constructions was calculated to achieve an STC 62 rating. Alternately, install two (2) layers of 5/8" Type 'X' gypsum board on 2x2 furring and resilient channel over the existing gypsum board. Insert 1" batt or board fiberglass insulation in the cavities formed by the furring associated with the clips. This construction also achieves an STC 62 rating.

- If a rating of STC 60 satisfies the township requirement, then install only one layer of gypsum board in lieu of the two layers above in either construction.

- A minimum batt insulation thickness of 5" is needed in attic ceiling joist cavities. Add additional batt to obtain the thickness as needed.

Refer to the next section of this report for typical construction notes and additional information.

General Notes about Partition Construction Methods and Materials

Gypsum board partitions must adhere to the following conditions:

a. Use 5/8" thick Type "X" gypsum wallboard with density of 2.2 lb/ft^2 or greater. Do not use USG Ultralight panels, which do not have the necessary density for the acoustic partitions described in this report.

b. Where batt insulation is called for in the sketches, it may be standard glass fiber, and it may be paper-faced or unfaced. It is not necessary to use "sound batt insulation" or mineral wool. The glass fiber batt must have 0.6 to 1.0 pcf density or minimum R-3.2 per inch thickness. Manufacturers include but are not limited to Knauf (EcoBatt), Owens-Corning (EcoTouch), Johns Manville and CertainTeed (Smart Batt).

c. All gaps between panels of gypsum, around gypsum wall or ceiling perimeters, and around gypsum wall/ceiling penetrations (no larger than ½" wide) shall be sealed airtight with acoustical sealant, such as Tremco Acoustical Sealant or equivalent.

d. When resilient clips are specified, use Kinetics Noise Control - IsoMax Clips or approved equivalent.
https://kineticsnoise.com/arch/isomax.html

e. If resilient channels are used, it must be the RC Deluxe model, manufactured by Clarke Dietrich.

Final Note

Please note that our recommendations and comments are exclusive to acoustics. We cannot comment on such things as local codes, life-safety requirements, or any other non-acoustic issues. Our recommendations should be reviewed by an appropriate design professional for code compliance before they are implemented.

This concludes our analysis and recommendations. We will be happy to elaborate on anything contained within this report.

Sincerely,

Soundscape Engineering LLC
Per:

Mandy Kachur, PE, INCE.Bd.Cert.
Principal Consultant
mkachur@SoundscapeEngineering.com
direct: (734) 494-0322

Anna Catton, MSAE
Consultant
acatton@SoundscapeEngineering.com
(734) 418-8663 x106

Appendix A: Soundscape Engineering Company Literature
Appendix B: Acoustical Terminology
Appendix C: Door Seal Description
Appendix D: Supporting Test Data

Appendix A: Soundscape Engineering Company Literature

Soundscape Engineering

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Company Profile

Acoustical design has a direct impact on people's perception and interaction with the built-environment. Functional success of a building includes providing the best acoustical environment for owners and occupants, whether that means speech privacy, ability to clearly hear the spoken word and music, or providing a quiet healthcare environment conducive to patient healing.

Soundscape Engineering LLC is a national engineering consulting firm specializing in acoustics, noise, and vibration control. Our team has consulted on a broad range of project types – engineering practical solutions that respect project budgets, aesthetics, and design constraints.

We utilize electronic communications and computer software to work seamlessly with clients all over North America. And whenever a physical presence is needed, our nationally central locations in Chicago and Detroit allow us to quickly travel to client meetings and perform site visits whether those sites are in Los Angeles, New York City, Atlanta, Vancouver or points in between.

We work closely with architects and engineers to ensure that projects have an acoustical environment that supports the facility programming and creates the impression of a quality space in which people want to work, live, or play.

When you require world-class, experienced and credentialed consultants, call in Soundscape Engineering. All of our consultants have degrees in engineering. Our Principal Consultants hold state engineering licenses and have been Board Certified by the Institute of Noise Control Engineering. They are involved with every project, ensuring that clients receive responsive service, attention to detail, and practical recommendations.

Service Quality

- Proactive approach
- Responsive service
- Extensive experience
- All consultants have engineering degrees
- Senior consultants have professional certifications
- Company owner involved with every project

Services

- Sound Isolation
- Room Shaping and Finishes Selection
- Mechanical and Electrical Systems Noise Control
- Design for Speech Privacy
- Vibration Assessment and Control
- Community Noise Impact
- Acoustical Measurements
- Vibration Measurements

If you want us to help you avoid or correct noise problems, we're ready with our practical approaches and solutions. If you want a soundscape that is carefully engineered to enhance your project, we're equipped with advanced engineering tools and are eager to assist. Contact us today and ensure that your project receives the attention to acoustics that it deserves.

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NCAC Member Firm

Sustainable Design

LEED and sustainable design projects are increasingly common. Even when acoustics is not an explicit consideration for these projects, such as the acoustical requirements necessary to accredit a school under the LEED for Schools system, unique acoustical issues do arise when sustainable design strategies are employed. Mr. Sevener is a LEED Accredited Professional and has been working on the design of LEED certified buildings since 2000. He and Soundscape Engineering are ready to address the acoustical challenges of your next LEED project.

Firm Accreditation

Soundscape Engineering LLC is an NCAC member firm. This means that the company has undergone the rigorous vetting necessary to be admitted to the National Council of Acoustical Consultants, the highest level of professional accreditation for acoustical consulting firms.

Firm Ownership Structure

Soundscape Engineering LLC is a limited liability company organized in the State of Indiana and is registered with the Illinois Secretary of State and the Michigan Secretary of State. Soundscape Engineering LLC is owned by partners Nathan Sevener and Mandy Kachur.

Corporate Insurance

Soundscape Engineering LLC carries professional liability coverage, a.k.a. errors and omissions insurance, with an annual aggregate and per claim limit of $1,000,000. We also carry general liability insurance. Certificates are available upon request.

Commendations

"I consider Mandy an expert in acoustical design and value her ability to understand and enhance each project regardless of program, budget, schedule, or other constraints."

- Jeff Gaines, Manager Planning & Programming
  Albert Kahn Family of Companies

"Nathan was able to work with our design to create a better end product."

- Perry Hausman, Senior Associate
  TowerPinkster

"Mandy is a person that I have a confidence upon to offer you quality 'sound & noise consulting' design services for your projects."

- Siraj Khan, Director of Engineering
  Oakland University

"We have been pleased with Nate's work now at multiple client sites. Nate has been engaged in efforts to analyze noise issues at existing sites as well as recommendations during design to achieve low noise levels."

- Dan Miles, Director Engineering & Planning
  BSA LifeStructures

"Nate has a sharp sensibility and patience with explaining acoustic concepts to clients that lends confidence to the decisions they (clients) make regarding complicated interior environmental quality issues."

– Julie Root, Associate Partner
  ZGF Architects

Note: Some of the above commendations are based on experiences working with Mr. Sevener & Ms. Kachur prior to the formation of Soundscape Engineering LLC.

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Project Experience - Environmental Noise and Vibration Assessment

The following is a sample of the many projects that constitute the career experience of our staff.

- **Central Lake County Joint Water Agency (CLCJAWA)**
  Lake Bluff Raw Water Pumping Station environmental noise survey.
  Rockland Road Treatment Plant environmental noise survey.
  Lake Bluff, Illinois
- **University of Michigan**
  Auxiliary Services Building 1 Thermal Hydraulics Laboratory environmental noise impact assessment.
  Ann Arbor, Michigan
- **Hobson Hill Development (Pulte Home Company)**
  Tollway noise impact assessment for proposed Hobson Hill residential subdivision in Woodridge, Illinois. Scope of services included ambient noise measurements, computer modelling of environmental noise propagation, determination of noise mitigation requirements, and attendance at meetings with Village and Tollway Authority.
  Woodridge, Illinois
- **Hamilton County Coal**
  Ambient environmental noise survey at properties in vicinity of coal mine.
  Dahlgren, Illinois
- **Nicor Gas Ancona Units 33&34**
  Community noise impact analysis and noise control recommendations for compressor installation project.
  Streator, Illinois
- **Dandy Acres Small Animal Hospital**
  Assessment of noise transmission to residential properties and noise control consulting to support design of addition to facility.
  Lyon Township, Michigan
- **M/I Homes Woodview Development**
  Traffic noise impact assessment for proposed residential development next to Interstate 355.
  Woodridge, Illinois
- **Prologis Park**
  Noise impact assessment for proposed 200 acre warehouse development with adjacent residential land-use.
  Lockport, Illinois
- **Toll Brothers Nixon Farm North**
  Traffic noise impact assessment for 68 acre residential development located next to Interstate 23.
  Ann Arbor, Michigan
- **Forging Plant (name not disclosed)**
  Environmental noise survey to determine compliance of drop forging operations with local noise regulations.
  Southeast, Michigan
- **City Hall Artspace Lofts**
  Conversion of City Hall buildings into work-live artist lofts. 3-D computer modeling of site and nearby roadways to calculate traffic noise impact on the Dearborn City Hall property and to assess the extent of building façade changes that would be needed to comply with HUD noise guidelines.
  Dearborn, Michigan
- **Hoosier Village**
  Monitoring of existing sound levels at multiple locations in large senior living community, TNM 2.5 (traffic noise) modeling of new roadway with heavy truck traffic to be constructed through property by City, modeling of alternate roadway proposed by community, determination of noise impact on community and length and height of sound barrier walls needed to mitigate impact. Issued report suitable for submission to City.
  Zionsville, Indiana
- **Mor/ryde**
  Measurement of noise emitted to environment by existing manufacturing facility, prediction of sound levels at residences near proposed plant expansion, attendance at County planning commission meeting.
  Elkhart, Indiana

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Project Experience - Environmental Noise and Vibration Assessment

- **11 W Quincy Music Venue**
  Consulting to project design team with respect to noise isolation of venue from adjacent buildings (butted together) and from other nearby properties, in order for the venue to meet the local noise ordinance. Also, follow-up testing per the requirements placed on the venue by the Village.
  Westmont, Illinois
- **City of Des Plaines (Events Venue Noise)**
  Consulting to the City with respect to noise produced by the Fountain Blue Banquet & Conference Center during events. Work included peer review of studies performed by Fountain Blue's consultants, meeting with residents, and attendance at City's Zoning Board of Appeals and City Council meetings.
  Des Plaines, Illinois
- **Sears Holdings Corporation**
  Data Center Expansion
  Community noise assessment and noise control, including environmental noise emissions and propagation modeling.
  Troy, Michigan
- **Standard Bar & Grill**
  Measurement of entertainment sound level in apartment building abutting client's establishment. Issue report for use in judicial proceedings.
  Chicago, Illinois
- **Northwestern University**
  18 months of monitoring ground vibration associated with construction of new Kellogg School of Management building.
  21 months of monitoring ground vibration associated with construction of Mudd Library building addition.
  Evanston, Illinois
- **Rs-FUELS**
  Measurement of car wash noise at several facilities and prediction of noise at residential property adjacent to proposed new car wash. Submission of report and presentation to Village Board of Trustees.
  Wilmette, Illinois
- **The Chapman House**
  Prediction and assessment of noise impact by a proposed outdoor event's venue located near residences. Preparation of report and presentation to City Planning Commission.
  Rochester, Michigan
- **Fort Knox Studios**
  Property line measurement of noise produced in recording studios located adjacent to residential development. Issued report for submission to City.
  Chicago, Illinois
- **K9 Club**
  Acoustical analysis and design recommendations for proposal animal boarding facility and veterinary clinic with nearby residential land uses. Attendance at zoning board of appeals hearing.
  Mundy Township, Michigan
- **Fibertex Nonwovens LLC**
  Property line noise level measurements near factory to assess level for compliance with noise code for the Village of Lakemoor.
  Lakemoor/Ingleside, Illinois
- **The Woodmont Two Condominiums Inc.**
  Assessment of noise produced by air-cooled chiller on adjacent commercial property and submission of report with options for noise mitigation.
  Indianapolis, Indiana
- **A. Finkl & Sons Co.**
  Ground vibration assessment for forging operations adjacent to residential community
  Chicago, Illinois
- **Down Range Tactical**
  Firing range noise measurement and assessment to determine compliance with State regulations.
  Spring Valley, Illinois
- **Advocate South Suburban Hospital**
  Design consulting for transformer upgrade and chiller plant addition, with the goal of maintaining the existing noise level at the hospital property line.
  Hazel Crest, Illinois

[1] Work performed by Soundscape Engineering working as sub-consultant to partner firm Daniel Lyzun & Associates Ltd. or Acoustic Arts & Engineering

[2] Work performed by firm Partner while employed by Ove Arup & Partners, Ltd., Acoustics By Design, Inc., or Albert Kahn Associates, Inc.

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Project Experience - Environmental Noise and Vibration Assessment

- **Land Rover Dealership**
  Noise impact study for proposed Land Rover Dealership, including measurement of existing ambient, identifying and measuring potential noise sources, 3-D computer modelling of noise propagation from dealership to adjacent single-family residential properties, and speaking at Village Board of Trustees meeting.
  Hinsdale, Illinois
- **Northeastern Illinois University**
  Computer modeling to predict noise emissions from proposed South Campus Central Utility Plant to residential neighborhood and design support to limit emissions to below limits imposed by City ordinance.
  Chicago, Illinois
- **Ypsilanti High School**
  Measurement of community noise from pool equipment.
  Ypsilanti, Michigan
- **Village of East Dundee**
  Advising Village on noise control and noise monitoring options for bars with outdoor beer gardens.
  East Dundee, Illinois
- **Concert Stage Noise Impact (Residential Client)**
  Peer review, for submission to City of Indianapolis, of noise assessment report for proposed outdoor concert stage and beer garden at Bent Rail Restaurant and Brewery.
  Indianapolis, Indiana
- **City of East Chicago**
  HUD assessment and building envelope design for housing near freight rail line
  East Chicago, Indiana
- **Irving Park Place (Pulte Homes)**
  Consulting with respect to tollway and railway noise and vibration impact on proposed residential development.
  Itasca, Illinois
- **Cottages at Barton Green**
  Assessment of noise impact by communal clubhouse and pool to be part of new residential development, on the existing adjacent residences. Services included measurement of existing ambient noise, 3-D computer modelling of sound propagation from pool and clubhouse to neighborhood, and recommendation of sound barrier wall locations and heights.
  Ann Arbor, Michigan
- **Nightclub Noise Impact**
  Measurement and assessment of noise emitted from bar through wall common to Client's building
  Ypsilanti, Michigan
- **Power Solutions International, Inc.**
  Design consulting to allow new engine test facility to meet State of Illinois Title 35 noise regulations.
  Itasca, Illinois
- **MSP Industries**
  Ground vibration and airborne noise assessment for forging facility located near residences.
  Oxford, Michigan
- **Food 'n' Fuel**
  Environmental impact assessment for new car wash and drive-through window proposed to be constructed on the site of an existing gas station with convenience store and fast-food restaurant. Noise assessed against Will County code and Illinois Title 35. Attendance at zoning board meeting.
  Frankfort, Illinois
- **Ryko Solutions, Inc.**
  Study commissioned by Ryko Solutions to quantify the sound level produced by MacNeil car wash dryers and determine if the dryers could meet the noise restrictions imposed by the City of McHenry.
  McHenry & Herscher, Illinois
- **Lodge at Nordman Lake**
  Survey noise emitted to distant residential neighbors during wedding ceremonies and receptions on large rural property with private lake. Issue report for submission to township.
  Dexter, Michigan (Lima Township)

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Project Experience - Environmental Noise and Vibration Assessment

- **Independence Place Apartments** [2]
  Rural Housing and Economic Development (RHED) assessment for apartment complex where train noise dominated; building envelope design for noise control
  Linton, Indiana
- **River Point Centre** [1]
  Cooling tower noise mitigation for ordinance compliance
  Winnipeg, Manitoba
- **Saskatoon Police Service Headquarters** [1]
  New 350,000 sq.ft., police headquarters building with budget of CAD$122 million. Environmental noise assessment included sound transmission from the 10 position indoor firing range and the building HVAC equipment and emergency gen-sets.
  Saskatoon, Saskatchewan
- **Palm Street Middle School** [2]
  Computer modeling to predict noise generated by new freeway to be built near school, peer review of State's predictions, measurement of sound isolation provided by existing building construction, recommendation of building upgrades to isolate classroom from future freeway noise.
  Lemon Grove, California
- **Ciena Healthcare**
  Property line sound level measurements to determine if rooftop exhaust fan at new skilled nursing facility is in compliance with township noise ordinance. Issue report for submission to township.
  Shelby Township, Michigan
- **Triple C Development**
  Computer modeling of noise emitted to environment by proposed Zippy's Car Wash. Comparison with State noise regulations and recommendation of noise mitigation options.
  Carol Stream, Illinois
- **Car Wash Property Line Noise Study**
  Measurement of noise produced by existing car wash and advising owner on mitigation options.
  Dearborn, Michigan
- **Perrigo Company**
  Measurement of noise produced by temporary air-cooled HVAC chiller and recommendation of options for reducing noise transmission to nearby residential neighborhood.
  Holland, Michigan
- **Marlborough Condominium Association**
  Measure noise level emanating from electrical vault across street from condominium building and issue report with assessment of whether the noise level exceeds any applicable regulations.
  Chicago, Illinois
- **Constellation Place** [2]
  Noise impact assessment and mitigation for bus and auto traffic associated with proposed new commercial tower
  Century City, California
- **Stratosphere Hotel and Casino** [2]
  Acoustical Analysis of Proposed Rollercoaster Type Attraction
  Las Vegas, Nevada

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Project Experience - Environmental Noise and Vibration Assessment

- **Universal Studios** [2]
  Acoustical assessment to support Master Plan Environmental Noise Impact Report and Noise Mitigation Measures for Theme Park and Studios
  Universal City, California
- **Linden Group Architects**
  Survey noise levels in and near operating dog kennels and issue report with the results. Attend zoning board meeting to describe implications proposed new kennel.
  Countryside and Oswego, Illinois
- **Doggie in the Window**
  Assessment and mitigation of sound from dog day care facility to neighboring building and properties
  Berkley, Michigan
- **Animal Samaritans SPCA**
  Prediction of proposed animal shelter noise impact on nearby residential zone.
  Thousand Palms, California
- **Humane Society of Huron Valley** [2]
  Design of exterior courtyard and noise barrier for control of dog barking noise to neighboring residences
  Ann Arbor, Michigan
- **Hayes Properties Inc.** [2]
  Design recommendations to reduce noise transfer from Ravenswood Billboard Factory (Events Space owned and operated by Client) to nearby single-family residential properties.
  Chicago, Illinois
- **J Paul Getty Villa** [2]
  Construction & operational noise prediction
  Malibu, California
- **J. Paul Getty Center** [2]
  Tram Noise Assessment & Mitigation
  Brentwood, California
- **Greek Theater** [2]
  Peer review of proposed community noise impact mitigation for large outdoor amphitheater
  Los Angeles, California
- **West Pico Drill Site Modernization** [2]
  BrietBurn Energy Company Oil drilling facility located in residential community
  Beverly Hills, California
- **UCLA Santa Monica Medical Center** [2]
  Environmental Impact Report
  Santa Monica, California
- **Avalon Del Rey** [2]
  EIR for large residential development
  Marina Del Rey, California
- **DuPont Fabros Technology Inc.** [2]
  Data center noise control
  Elk Grove Village, Illinois
- **City of Elkhart** [2]
  Noise and Vibration Assessment for "Mega-Shredder"
  Elkhart, Indiana
- **Weatherford International** [2]
  Rotaflex Oil Pump
  Carlsbad, New Mexico
- **Randy's Metal Recycling** [2]
  Environmental noise assessment for proposed metal shredder
  Benton Charter Township, Michigan
- **DaimlerChrysler AG** [2]
  Kenosha Engine Plant
  Kenosha, Wisconsin
- **DaimlerChrysler AG** [2]
  Transmission Plant
  Kokomo, Indiana
- **Chiyoda AES, Inc.** [2]
  DMAX North American Diesel Engine Plant
  Moraine, Ohio
- **Beck North Corporate Park** [2]
  Community noise assessment and prediction
  Novi, Michigan
- **Verizon Wireless** [2]
  Murray Hill Condensing Units – impact and mitigation on neighboring condominium complex
  Cleveland, Ohio
- **School District of the City of Royal Oak** [2]
  Chiller and heat recovery unit noise mitigation
  Royal Oak, Michigan
- **Troy School District** [2]
  Baker Middle School chiller noise mitigation

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Curriculum Vitae

Since 1991, Mandy Kachur has worked as an acoustics and noise control engineer. At Soundscape Engineering, she is responsible for all aspects of architectural acoustics project work and client development in addition to engineering analysis and measurement in room acoustics, sound isolation, building systems noise and vibration control, and community noise control.

She has worked on over 350 architectural projects, including auditoriums, healthcare facilities, university buildings, K-12 schools, acoustical and other laboratories, corporate offices, government, hotel and residential buildings, performing arts and recording spaces, worship, museums, and industrial facilities.

These projects include the award winning Henry Ford Health System West Bloomfield Hospital (560,000 sq.ft., 300 bed addition and 250,000 sq. ft. renovation), the Indiana Tech Law School Building (70,000 sq.ft. new construction), the LEED Gold Certified Agro-Culture Liquid Fertilizers World Headquarters Building (40,000 sq.ft. new construction), and the State of Michigan Hall of Justice, which houses the State Supreme Court and Court of Appeals (281,000 sq.ft. new construction). Her many small projects are just as important and include the LEED Gold Greenhills School addition in Ann Arbor and room acoustics for the Okemos Community Church.

In addition to working for acoustics consulting firms, she has also been an acoustics specialist at a medium sized Detroit architectural/engineering firm, where daily integration into multi-discinplinary project teams heightened her sensitivity to the need for practical acoustical solutions to mesh with all aspects of a project's design.

Mandy is a Board-Certified Member of the Institute of Noise Control Engineering, currently serving as the Vice President of Public Relations, and is a prior member of the Board of Directors and chair of the Building Acoustics Technical Committee. She is a member of teams that contribute to the Facilities Guidelines Institute *Guidelines for Design and Construction of Health Care Facilities*.

Mandy Kachur
Principal Consultant
PE, INCE.Bd.Cert.

She is an adjunct professor at Lawrence Technological University, and has been published at INCE conferences, at ASA meetings and in the peer reviewed American Journal of Nursing. Most recently, she was selected as a speaker at the National Academy of Engineering: Japan-America Frontiers of Engineering Symposium, presenting on healthcare acoustics. She is also a violinist with the Dearborn Symphony Orchestra.

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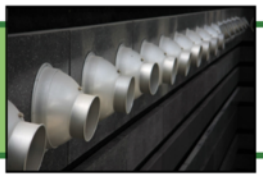

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Professional History

2011-present – Partner & Principal Consultant, Soundscape Engineering LLC

2004-2011 – Senior Consultant, Acoustics By Design, Inc., Ann Arbor, Michigan

1999-2004 – Acoustics Specialist, Albert Kahn Associates, Inc., Detroit, Michigan

1998 – Kolano and Saha Engineers, Inc., Project Engineer, Waterford, Michigan

1994-1998 – Ford Motor Company, Inc., Product Design Engineer, Sound Quality Group, Dearborn, Michigan

1992-1994 – The Boeing Company, Inc., Product Engineer, Noise Engineering, Seattle, Washington

1992 – Kirkegaard & Associates, Inc., Intern, Downers Grove, Illinois

1991 - The Boeing Company, Inc., Intern, Noise Engineering, Seattle, Washington

1987-1990 – British Petroleum, Co-op Student, Cleveland, Ohio

Education

M.E. in Acoustics, The Pennsylvania State University, 2008

B.S. Mechanical Engineering, Purdue University, 1991

Credentials

Board Certified, Institute of Noise Control Engineering

Licensed Professional Engineer, State of Michigan, #6201045637

Professional Associations

Acoustical Society of America

Institute of Noise Control Engineering

American Society of Heating, Refrigerating and Air Conditioning Engineers

Publications & Presentations

"Managing Noise in Healthcare Environments to Improve Patient Outcomes," 2014 Japan-America Frontiers of Engineering Symposium, National Academy of Engineering

"Acoustical materials for a green world: The sustainable design transformation of the architectural acoustics industry," Acoustical Society of America, Baltimore Meeting 2010

"Architectural acoustics: Emerging opportunities require new materials and solutions," Acoustical Society of America, Baltimore Meeting 2010

"Small and Large Room Acoustics: Similarities and Differences," Presentation to the Detroit Section of the Audio Engineering Society, 2010

"Ensuring Quieter Hospital Environments," American Journal of Nursing, 2009

"A Case Study Of A Successful Patient Unit Noise Reduction Program," Planetree Webinar, 2009

"Making Music with the DSO," Detroit Symphony Orchestra PBS interview, 2009

"The greening of sound: Recent inclusion of acoustics in sustainable building certification," Noise-Con Proceedings 2007

"LEED and Acoustics: Compatibility Check," Seminars on Sustainability, Detroit Chapter of ASHRAE and Lawrence Technological University conference, 2007

"Design and capabilities of a new sound and vibration laboratory at Valeo" InterNoise Proceedings 2002

"A survey of sound quality jury evaluation correlations: Loudness versus A-weighted sound level" Mandy Kachur Sound Quality Symposium Proceedings 1998

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3711 N. Ravenswood Ave., Ste. 104
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Plymouth, MI 48170
(734) 418-8663

www.SoundscapeEngineering.com

Appendix B: Acoustics Terminology

Sound level is measured in units called decibels (abbreviated dB). Decibels are logarithmic rather than linear quantities and thus a doubling of the sound level does not translate to a doubling of decibels. Also, the human ear does not interpret a doubling of sound energy as a doubling of loudness. The logarithmic nature of dB and the human subjective perception of relative sound levels result in the following approximate rules for judging increases in noise.

- 3 dB sound level increase or decrease - barely perceptible
- 5 dB sound level increase or decrease - perceptible and is often considered significant
- 10 dB sound level increase or decrease - perceived as twice as loud/half as loud

These perceived changes in the noise level are mostly independent of the absolute noise level. That is, a 35 dB noise will be perceived as twice as loud as a 25 dB noise, and a 60 dB noise will be perceived as twice as loud as a 50 dB noise.

Audible sound occurs over a wide frequency range, from low pitched sounds at approximately 20 hertz (Hz) to high pitched sounds at 20,000 Hz. These frequencies are commonly grouped into octave bands or 1/3 octave bands. Building mechanical systems generally produce noise in the 63 Hz to 1000 Hz octave bands, with the lower frequency noise generated by large fans. Human speech is predominantly contained in the 250 Hz to 2000 Hz octave bands. The highest sound levels of barking dogs are found in the 500 and 1000 Hz octave bands.

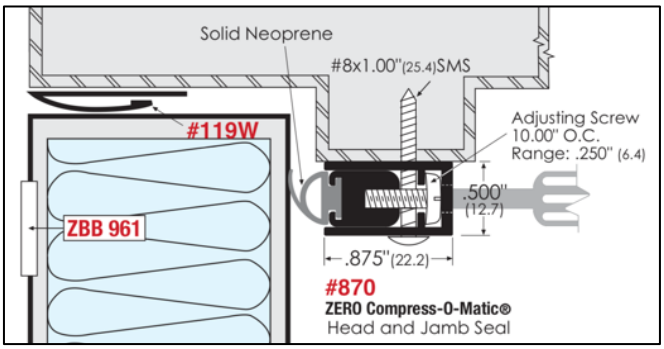
A-weighted sound level - Humans do not hear equally well at all frequencies. We are especially poor at hearing low frequency sound and are best at hearing sound in the frequency range of human speech. A microphone does not have these same characteristics. Therefore, when sound is being measured to determine how well people will be able to hear it, a "weighting" or microphone-to-human correction factor is applied to the sound level measured using a microphone. The most common weighting is the "A-weighting" and the resulting sound level is expressed in A-weighted decibels (dBA). This weighting reduces the low frequency sound, slightly increases the sound at the dominant frequencies of human speech, and slightly lowers the sound level at high frequencies.

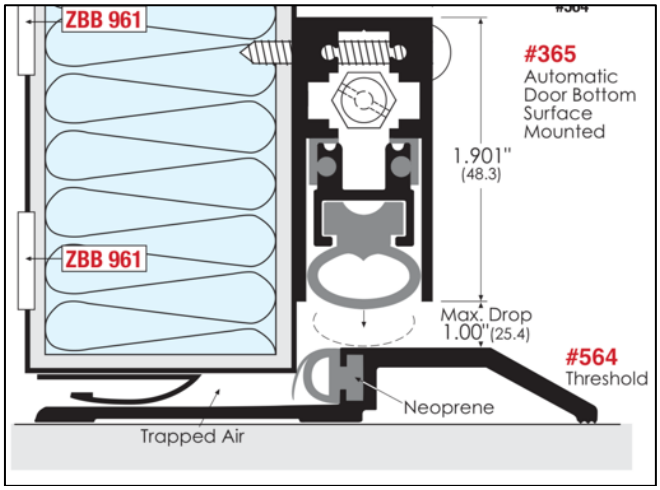
Sound Transmission Class (STC) is a single number rating of the amount of sound blocked by a partition as measured or calculated in one-third octave bands. This metric is normalized and can be compared other partitions or test data. It is measured in a laboratory under ideal conditions. STC is most appropriately used to assess the ability of a partition to block noise in the frequency range of speech. The original sound transmission test reports should be consulted when the sound source contains low frequencies, such as music or mechanical noise. A higher number indicates better performance.

Ceiling Attenuation Class (CAC) is a single number rating of the sound blocking ability from room to room of a lay-in ceiling tile and grid system. Higher numbers mean better performance. Most commercial mineral fiber acoustical lay-in ceiling tiles have a CAC of 35 or 40.

Appendix C: Door Seal Description

These are 1-¾" thick solid core wood or insulated 16-18 gauge metal doors. They need to have adjustable acoustic seals at the head and jambs plus an automatic door bottom which seals against a saddle or threshold. Zero International and Pemko can provide such seals.



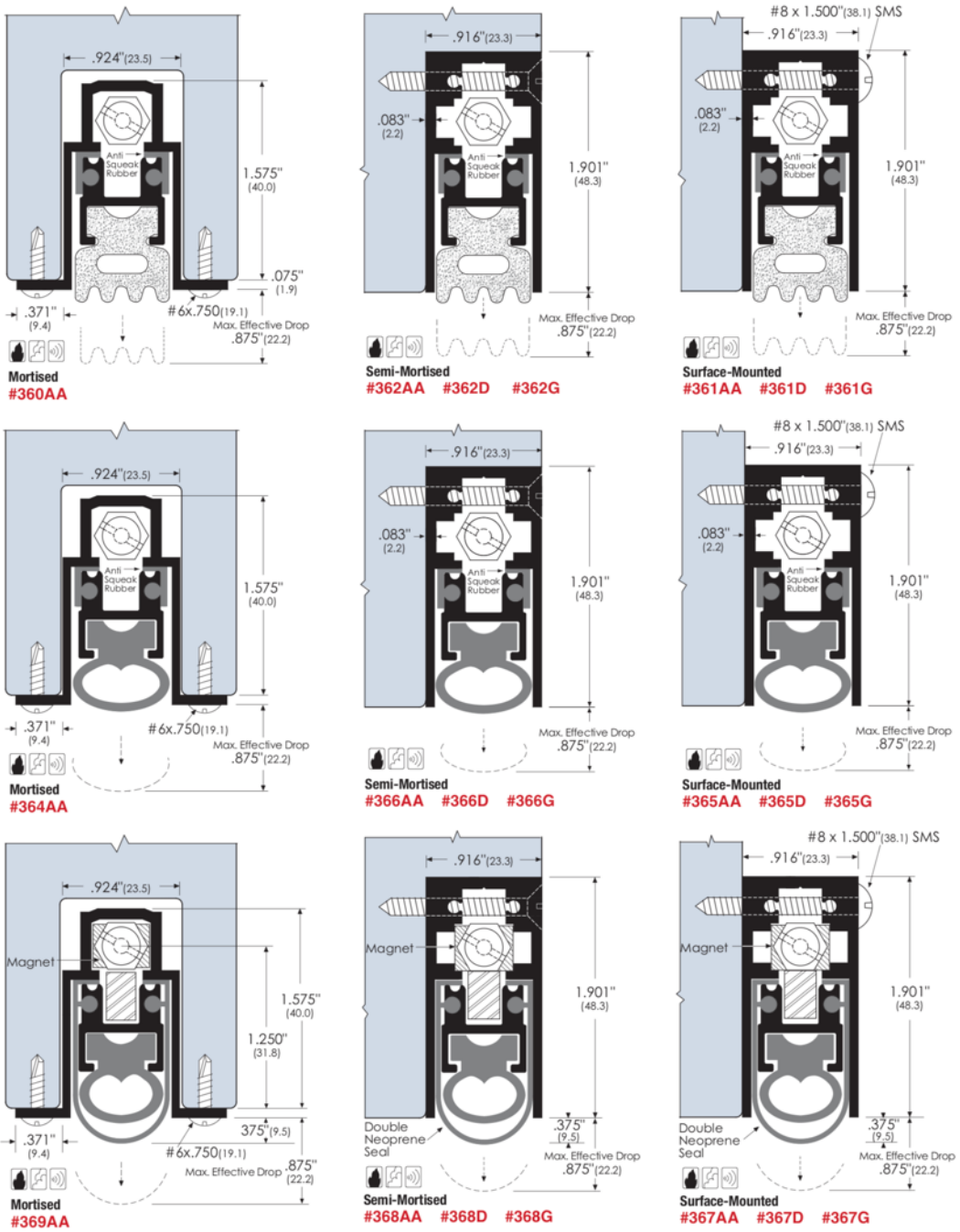


Zero International acoustical sealing system at head and sill

- Install sound rated door head and jamb seals from Zero International, model #870 or Pemko equal. This model has an adjustable seal for optimization over time.

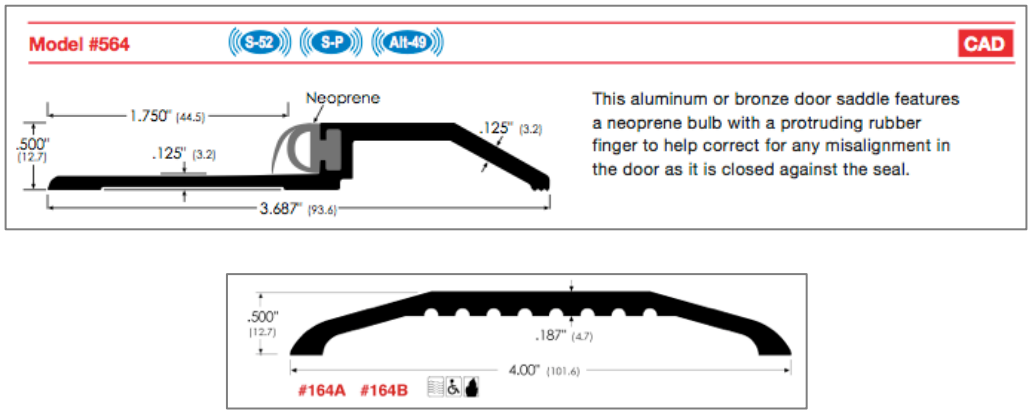
- Install a supplemental bronze spring seal at the head, jambs, and sill (Zero International model #119W or Pemko equal). Attach to the frame.

- Install a mortised, semi-mortised, or surface mounted Zero International model #360 series automatic door bottom or Pemko equal.



Zero International model #367

- Install a metal threshold. Two types are shown below. The Zero International model #564 is preferred since it has an integral seal, thus providing a secondary seal. A smooth flat threshold, such as Zero International model #164B, is also acceptable, though will not perform quite as well due to the lack of the secondary seal. Pemko equals are acceptable. In all cases, the automatic door bottom should seal against the flat smooth surface. Level the threshold and embed in acoustical caulk for an airtight seal. The automatic door bottom must provide a continuous seal over the width of the door, and thus the leveling of the sill is critical.



Zero International model #564 and #164B

Appendix D: Supporting Test Data and Calculations

Project No. : 1633
Project : Dog Town & Kitty City - Building Envelope Design

Partition Transmission Loss & Sound Propagation to North Property Line

assumptions: reverberant field near wall in Source Room and SPL is near the wall in Receiver Room

Partition Dimensions
10 ft
55 ft

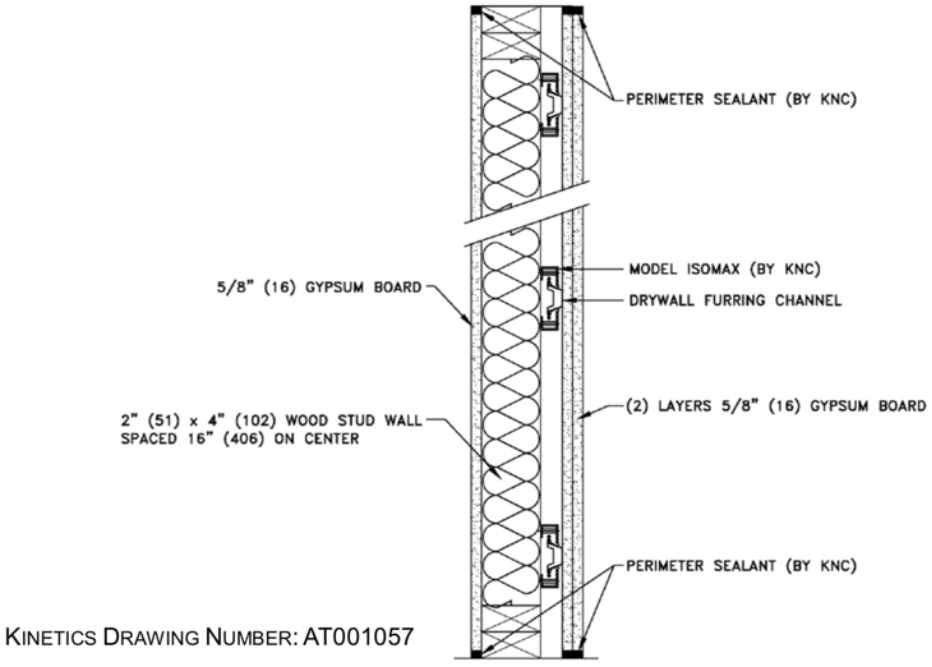
	Octave Band Center Frequency						
	125	**250**	**500**	**1000**	**2000**	**4000**	**8000**
Sound level of dogs barking in large reverberant space - 102 dBA maximum level	84	90	104	101	93	80	79
transmission loss of recommended partition	-36	-50	-60	-64	-63	-69	-69
Factor for outdoor free field	15000	15000	15000	15000	15000	15000	15000
Sound level just outside exterior wall	**43**	**36**	**39**	**32**	**25**	**6**	**5**
dBA weighting	-16	-9	-3	0	1	1	-1
dBA per octave band	**27**	**27**	**36**	**32**	**26**	**7**	**4**

Overall dBA outside building	**38**
Propagation to north property line at 312' away	-24
Credit for 150' of trees	-4
Overall dBA at north property line	**11**

Exterior wall construction at plywood sheeting locations (blue walls)

KINETICS NOISE CONTROL TEST REPORT #AT001057

- **KINETICS NOISE CONTROL PRODUCTS:**
  - ISOMAX CLIPS
- **ACOUSTICAL RATINGS:**
  - STC 61
- **TESTING AGENCY & REPORT NUMBER:**
  - RIVERBANK ACOUSTICAL LABORATORIES
  - RAL TL02-35



KINETICS DRAWING NUMBER: AT001057

KINETICS Noise Control

6300 IRELAN PLACE, DUBLIN OH
PHONE: 800.959.1229
FAX: 614.889.0540
WEB: WWW.KINETICSNOISE.COM
EMAIL: ARCHSALES@KINETISNOISE.COM

RIVERBANK ACOUSTICAL LABORATORIES
OF
IIT RESEARCH INSTITUTE
1512 S. BATAVIA AVENUE
GENEVA, ILLINOIS 60134
630/232-0104
FOUNDED 1918 BY
WALLACE CLEMENT SABINE

REPORT

FOR: Kinetics Noise Control

Sound Transmission Loss Test
RAL™-TL02-35

ON: Kinetics Wall Isolation Clip on
2 x 4 Timber Framing 16 Inches on Center
With Single Layer 5/8 Inch Gypsum Board Direct
and Double Layer 5/8 Inch Gypsum Board on Clips

CONDUCTED: 21 February 2002

TEST METHOD

Unless otherwise designated, the measurements reported below were made with all facilities and procedures in explicit conformity with the ASTM Designations E90-99 and E413-87, as well as other pertinent standards. Riverbank Acoustical Laboratories has been accredited by the U.S. Department of Commerce, National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP) for this test procedure. A description of the measuring technique is available separately.

DESCRIPTION OF THE SPECIMEN

The test specimen was designated by the client as Kinetics Wall Isolation Clips on 2 x 4 timber framing 16 inches on center with single layer 5/8 inch gypsum board direct and double layer 5/8 inch gypsum board on clips. The overall dimensions of the specimen as measured were 4.27 m (168 in.) wide by 2.74 m (108 in.) high and 171 mm (6.75 in.) thick. The specimen was installed directly into the laboratory's 2.74 m (9 ft) by 4.27 m (14 ft) wood-lined steel frame and was sealed on the periphery (both sides) with a dense mastic.

The description of the specimen was as follows: The test specimen consisted of a two-by-four wood stud wall assembly with 159 mm (6.25 in.) thick R-19 fiberglass and a single layer of 16 mm (0.625 in.) Type X gypsum board on the receive side. Kinetics Wall Isolation Clips and hat track were used on the source side with a double layer of 16 mm (0.625 in.) Type X gypsum board. A more complete description follows.

Floor and Ceiling Plates: The two 89 mm (3.5 in.) wide by 38 mm (1.5 in.) thick and 4.27 m (168 in.) long SPF wood plates were attached to the top and bottom of the test frame with 16d nails on 610 mm (24 in.) centers.

Studs: The twelve 89 mm (3.5 in.) wide by 38 mm (1.5 in.) thick and 2.67 m (105 in.) long SPF wood studs and runners were spaced on 406 mm (16 in.) centers. The studs were attached to the frame with 8d nails.

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REPORT

Kinetics Noise Control

RAL™-TL02-35

21 February 2002

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Insulation: The cavities formed by the studs were friction fit with R-19 unfaced fiberglass insulation batts measuring 159 mm (6.25 in.) thick and 381 mm (15 in.) wide.

Kinetics Wall Isolation Clips and Hat Track: On the source side of the wall, Kinetics Wall Isolation Clips were attached to studs on 610 mm (24 in.) centers vertically and on 1.22 m (48 in.) centers horizontally. The bottom row of clips was installed 76 mm (3 in.) from the bottom of the test frame. Clips in subsequent rows were staggered 406 mm (16 in.) vertically from adjacent rows. All clips were attached to studs with two 51 mm (2 in.) long coarse thread drywall screws. A total of thirty clips were used. The hat track was 25 gauge roll-formed furring channel which measured 22 mm (0.875 in.) deep by 65 mm (2.56 in.) wide. Six rows of track were mounted to the clips and were overlapped 152 mm (6 in.) and double wire tied with 18 gauge tie wire as necessary.

Gypsum Wallboard: A double layer of 16 mm (0.625 in.) Type X gypsum board was applied to the hat track on the source side of the wall. The base layer was applied horizontally and the face layer was applied vertically with fasteners on 305 mm (12 in.) centers. The gypsum board was attached using 25 mm (1 in.) and 41 mm (1.625 in.) long Type S bugle head drywall screws, respectively. A single layer of 16 mm (0.625 in.) Type X gypsum board was applied vertically to the studs on the receive side of the wall and attached using 41 mm (1.625 in.) Type W bugle head drywall screws on 305 mm (12 in.) centers. All joints were treated with an acoustical caulk in the joints and covered with aluminum faced tape. Screw heads were covered with tape.

The weight of the specimen as measured was 530.3 kg (1,169 lbs.), an average of 45.4 kg/m^2 (9.3 lbs/ft^2). The transmission area used in the calculations was 11.7 m^2 (126 ft^2). The source and receiving room temperatures at the time of the test were 21±2°C (70±2°F) and 59±2% relative humidity. The source and receive reverberation room volumes were 179m^3 (6,298 ft^3) and 177 m^3 (6,255 ft^3), respectively.

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Kinetics Noise Control

RAL™-TL02-35

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TEST RESULTS

Sound transmission loss values are tabulated at the eighteen standard frequencies. A graphic presentation of the data and additional information appear on the following pages. The precision of the TL test data is within the limits set by the ASTM Standard E90-99.

FREQ.	T.L.	C.L.	DEF.	FREQ.	T.L.	C.L.	DEF.
100	33	0.35	0	800	63	0.37	0
125	37	0.28	8	1000	63	0.29	1
160	42	0.26	6	1250	65	0.22	0
200	46	0.33	5	1600	64	0.25	1
250	52	0.37	2	2000	61	0.20	4
315	57	0.32	0	2500	64	0.18	1
400	59	0.34	1	3150	67	0.16	0
500	61	0.33	0	4000	69	0.14	0
630	61	0.36	1	5000	71	0.11	0

STC=61

ABBREVIATION INDEX

FREQ. = FREQUENCY, HERTZ, (cps)
T.L. = TRANSMISSION LOSS, dB
C.L. = UNCERTAINTY IN dB, FOR A 95% CONFIDENCE LIMIT
DEF. = DEFICIENCIES, dB<STC CONTOUR
STC = SOUND TRANSMISSION CLASS

Tested by _____ Approved by _____

Dean Victor
Senior Experimentalist

David L. Moyer
Laboratory Manager

THE RESULTS REPORTED ABOVE APPLY ONLY TO THE SPECIFIC SAMPLE SUBMITTED FOR MEASUREMENT. NO RESPONSIBILITY IS ASSUMED FOR PERFORMANCE OF ANY OTHER SPECIMEN.

NVLAP ACCREDITED BY DEPARTMENT OF COMMERCE, NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM FOR SELECTED TEST METHODS FOR ACOUSTICS. THE LABORATORY'S ACCREDITATION OR ANY OF ITS TEST REPORTS IN NO WAY CONSTITUTES OR IMPLIES PRODUCT CERTIFICATION, APPROVAL, OR ENDORSEMENT BY NIST.

RIVERBANK ACOUSTICAL LABORATORIES

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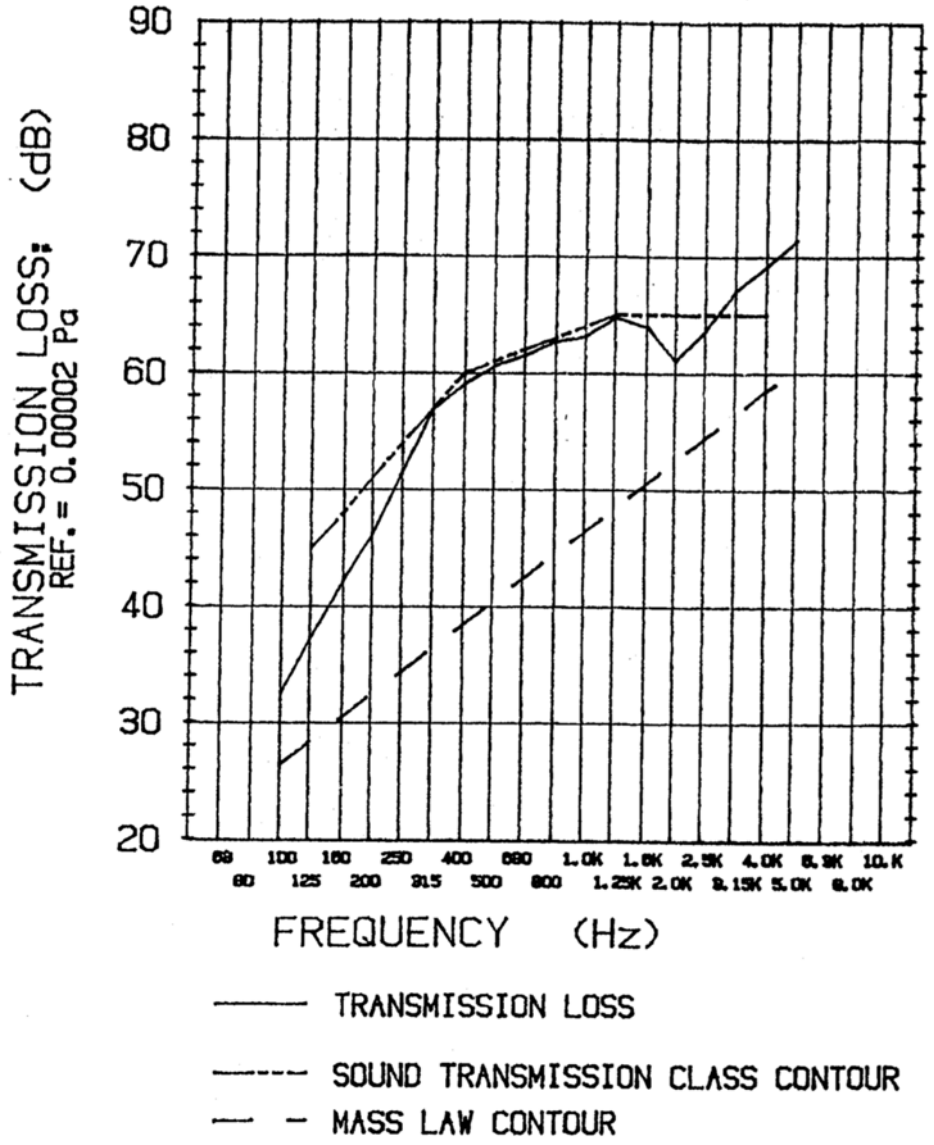
630/232-0104
FOUNDED 1918 BY
WALLACE CLEMENT SABINE

REPORT

TRANSMISSION LOSS REPORT
RAL-TL02-35

PAGE 4 OF 4



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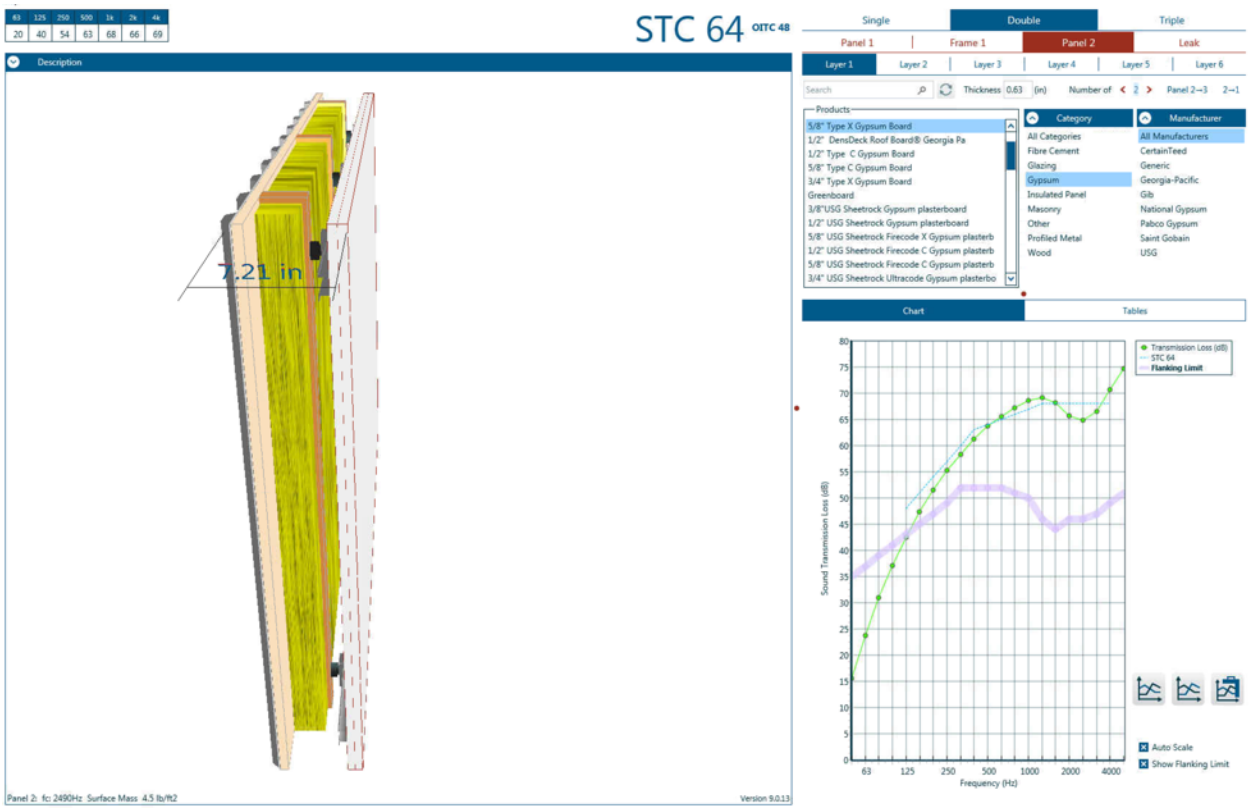
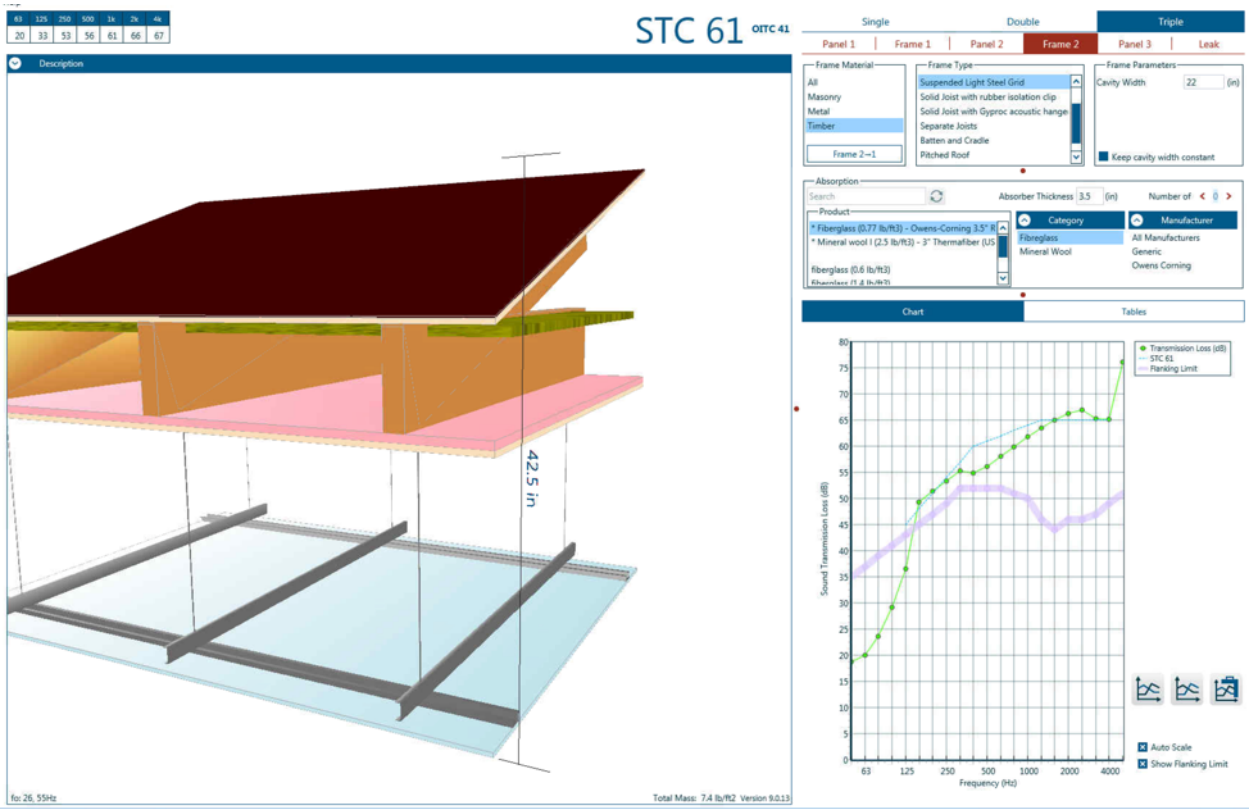
NVLAP

ACCREDITED BY DEPARTMENT OF COMMERCE, NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM FOR SELECTED TEST METHODS FOR ACOUSTICS. THE LABORATORY'S ACCREDITATION OR ANY OF ITS TEST REPORTS IN NO WAY CONSTITUTES OR IMPLIES PRODUCT CERTIFICATION, APPROVAL, OR ENDORSEMENT BY NIST.

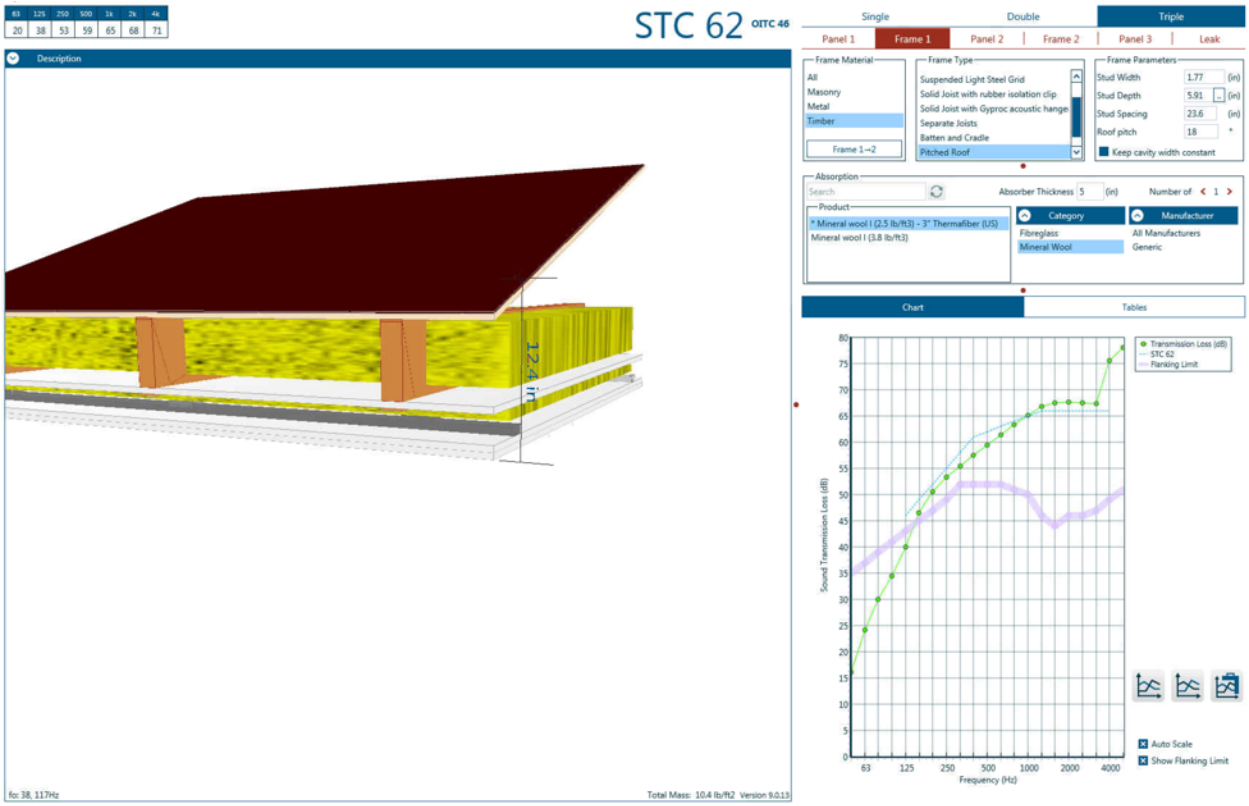
Exterior wall with metal siding (orange walls)



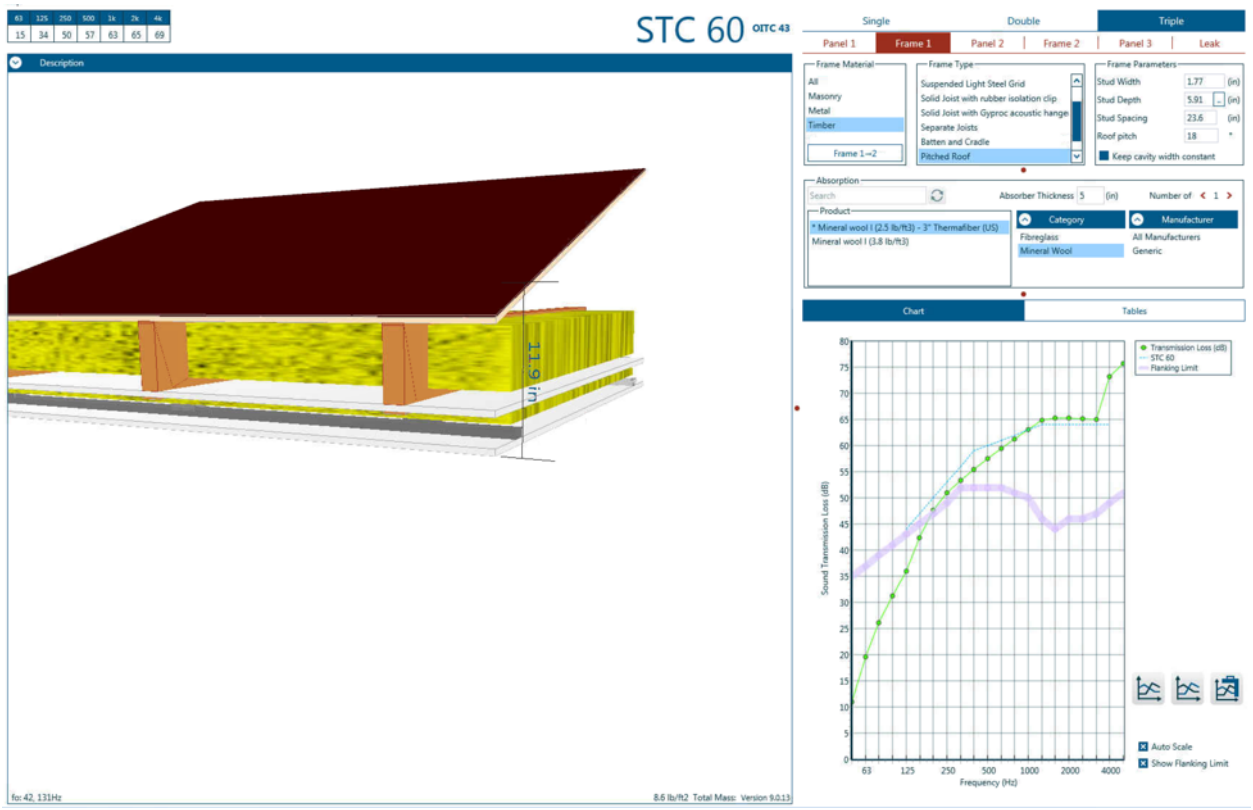
Ceiling/roof over Indoor Play Area



Ceiling/roof over Overnight Area – Two Additional Layers of Gypsum Board



Ceiling/roof over Overnight Area – One Additional Layer of Gypsum Board



National Research Council Canada (NRC) test data was used as a second reference for pitched roof constructions for comparison to the ceiling/roof of the Overnight Area. It is within one point of our calculations, which indicates a high confidence level that the predictions are accurate.

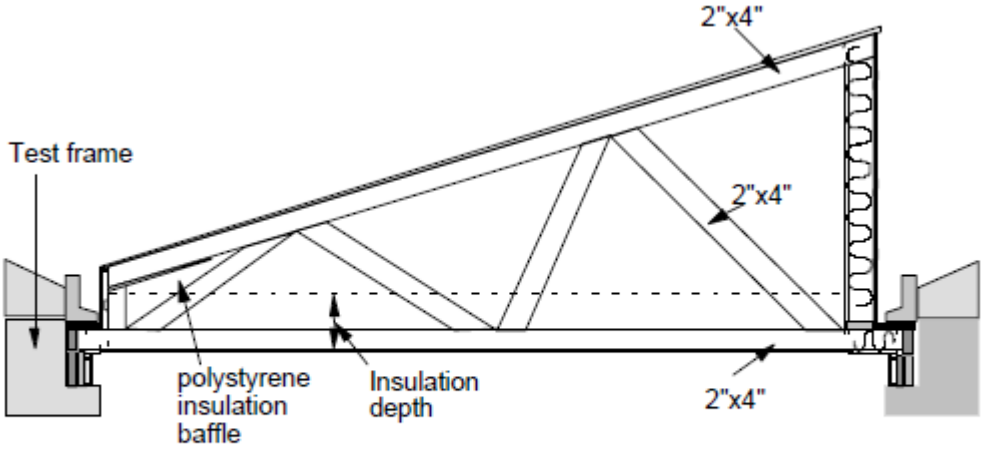
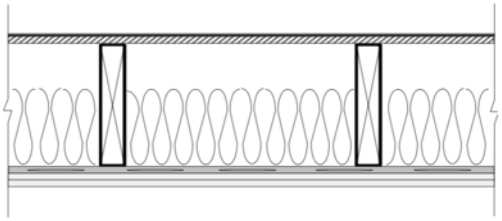


Figure 37. Sketch of section of the raised heel wood-truss roof construction in the test frame intended to represent half of a typical roof structure. The trusses were constructed of 2" by 4" lumber (38 mm by 89 mm) and with a 4 in 12 slope.

NRC-CNRC National Research Council Canada

TLF-98-111a
SHN3_BPAP0.7_OSB11_RHWT1626_GFB264_RC13(610)_2G13
Construction Type: roof

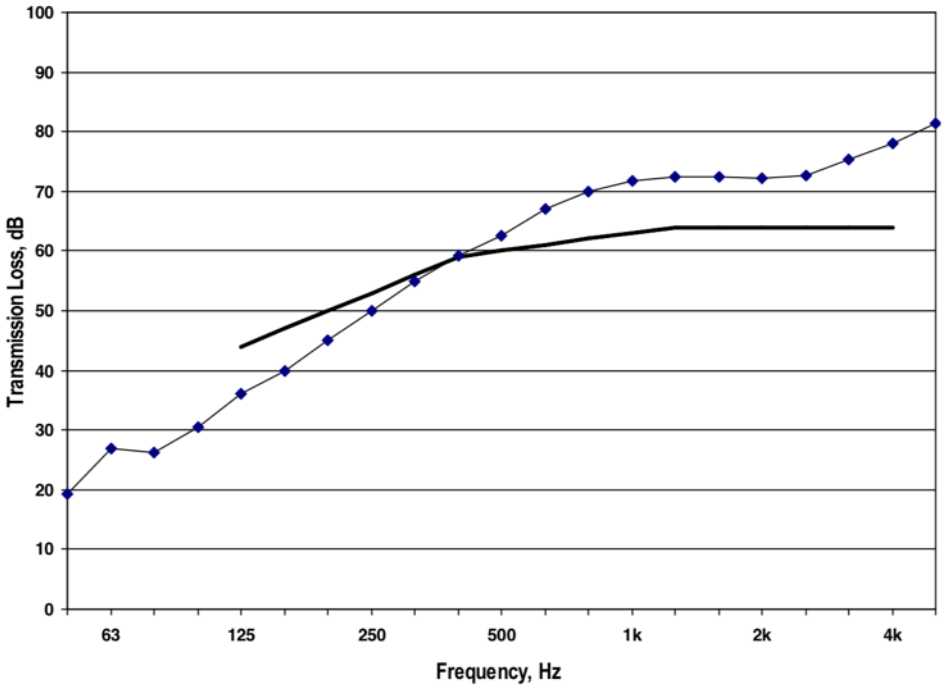
Element	Description
1	3 mm thick asphalt shingles
2	0.7 mm thick building paper
3	11 mm thick oriented strand board
4	1626 mm deep raised heel wood truss
5	264 mm thick glass fibre insulation in cavity
6	13 mm resilient channel at 610 mm on centre
7	13 mm thick regular gypsum board
8	13 mm thick regular gypsum board



Vents: roof (6)	element 1	element 2	element 3	element 4	element 5	element 6	element 7	element 8
type	shingles	building paper	subfloor	RH truss	insulation	resilient chan.	gypsum board	gypsum board
material	asphalt	*	OSB	wood	glass fibre	GP	regular	regular
thickness (mm)	3	0.7	11	1626	264	13	13	13
spacing (mm)	*	*	*	610	*	610	*	*
total mass (kg)	201	4.9	109	284	62	6.8	116	116
linear density (kg/m)	*	*	*	6.2	*	0.2	*	*
surface density (kg/m^2)	12	0.2	6.8	*	4.1	*	7.8	7.7
fastener spacing #1 (mm)	*	*	152 edges	*	*	*	610	305
fastener spacing #2 (mm)	*	*	305 field	*	*	*	*	*

* indicates not applicable

Freq, Hz	TL, dB
50	19
63	27
80	26
100	31
125	36
160	40
200	45
250	50
315	55
400	59
500	63
630	67
800	70
1000	72
1250	72
1600	72
2000	72
2500	73
3150	75
4000	78
5000	81
STC	60
OITC	43



A SITE PLAN FOR

"DOG TOWN & KITTY CITY, LLC"

GENOA TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN

TAX ID# 4711-05-300-006

LEGAL DESCRIPTION:

BEGINNING AT THE CENTER OF SECTION 5, T2N, R5E, GENOA TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN AS MONUMENTED; THENCE N88°31'51"W (PREVIOUSLY RECORDED AS S89°01'W) 177.42 FEET ALONG THE EAST–WEST 1/4 LINE OF SAID SECTION AS PREVIOUSLY SURVEYED AND MONUMENTED; THENCE S02°24'39"W 649.99 FEET (PREVIOUSLY RECORDED AS S01°1'W 651.48 FEET) TO A POINT ON THE CENTER LINE OF GRAND RIVER AVENUE; THENCE S60°26'30"E 200.34 FEET (PREVIOUSLY RECORDED AS S62°42'E 200 FEET) ALONG SAID CENTER LINE; THENCE N02°20'38"E 744.32 FEET (PREVIOUSLY RECORDED AS N0°11'E 746.38 FEET) ALONG THE NORTH–SOUTH 1/4 LINE OF SAID SECTION 5 AS PREVIOUSLY SURVEYED AND MONUMENTED TO THE PLACE OF BEGINNING. BEING A PART OF THE SOUTHWEST 1/4 OF SECTION 5, T2N, R5E, GENOA TOWNSHIP, LIVINGSTON COUNTY, MICHIGAN CONTAINING 2.83 ACRES OF LAND, MORE OR LESS, BEING SUBJECT TO THE RIGHTS OF THE PUBLIC OVER THE SOUTHWESTERLY 50.00 FEET THEREOF, AS IS OCCUPIED BY GRAND RIVER AVENUE, ALSO BEING SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD, IF ANY.

SCALE 1"=20'

20 0 20 40

SITE NOTES:

1) THE APPLICANT PROPOSES TO REMOVE AN AREA OF EXISTING ASPHALT PAVEMENT AND INSTALL K-9 GRASS WITH A VINYL PRIVACY FENCE. ALL OTHER CHANGES WILL BE BUILDING RELATED.
2) THE CURRENT STORM DRAINAGE SHEET FLOWS TO THE WEST PROPERTY LINE AND THEN TO THE BACK OF THE PROPERTY. THE K-9 GRASS WILL DECREASE THE OVERALL AREA OF IMPERVIOUSNESS OF THE SITE.
3) NO ANIMAL WASTE SHALL BE DISPOSED OF IN TWP SEWERS.

UTILITY NOTES:
1) NO CHANGE TO THE CURRENT WATER SERVICE IS PROPOSED.
2) NO CHANGE TO THE CURRENT SANITARY IS PROPOSED.
3) NO CHANGE TO THE STORM DRAINAGE SYSTEM IS PROPOSED.

ENVIRONMENTAL IMPACT NOTE:

THE APPLICANT PROPOSES TO REMOVE A PORTION OF THE ASPHALT PAVEMENT AND INSTALL K9 ARTIFICIAL TURF SYSTEM, REDUCING THE OVERALL STORM WATER RUNOFF FROM THE SITE. THE TURF SYSTEM IS MEANT TO COLLECT AND THEN DISPOSE OF THE LIQUID PET WASTE WITHIN THE STONE BED USING AEROBIC MICROBES. THIS PROCESS IS FASTER AND MORE EFFICIENT THAN THAT OF NATURAL MICROBIAL SOIL BREAK DOWN. ALL SOLID PET WASTE WILL BE COLLECTED AND DISPOSED OF IN THE REFUSE CONTAINERS.

OWNER:

LULA, LLC
28715 HOVEY LANE
NEW HUDSON, MI 48165
PHONE: 248-798-6226

PROPRIETOR/DEVELOPER:

PAULA VANDERKARR
7692 BADGER COURT
OWASSO, MI 48867
PHONE: 989-277-1864

SURVEYOR:

GARLOCK-SMITH
516 EAST GRAND RIVER
HOWELL, MICHIGAN 48843
PHONE: 517-546-3340

PARKING CALCULATION:

BUILDING = 6,312 SF
MAX # OF PETS ALLOWED = 6,312 SF / 100 SF/PET = 63 PETS

SPACES REQUIRED
1 SPACE PER STAFF MEMBER
1 SPACE PER EACH 5 ANIMALS
63 PETS / 5 ANIMALS/SPACE = 13 SPACES
5 EMPLOYEES = 5 SPACES
18 SPACES REQUIRED
21 SPACES PROVIDED

DRAINAGE CALCULATION:

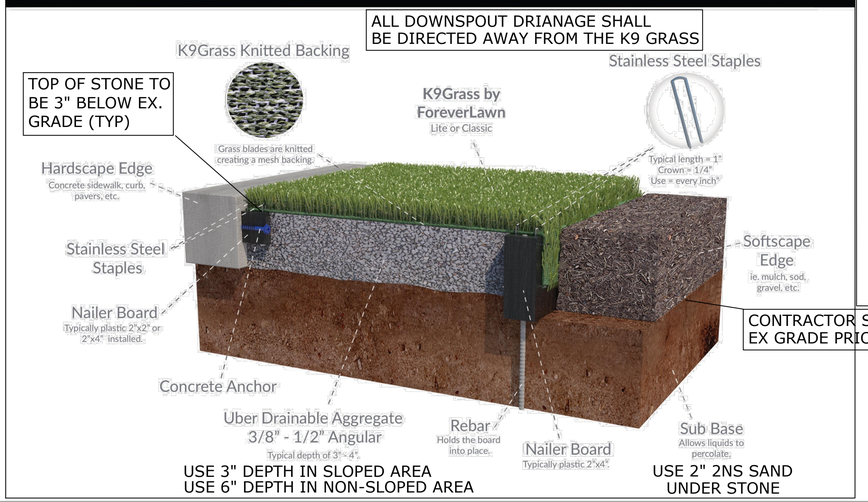
K9 GRASS AREA = 1340 SF = 0.03 AC.
C FACTOR = 0.3
STORAGE ONLY IN NON-SLOPED GRASS AREA = 818 SF
40% VOID RATIO
100yr V=16,500(0.3)(0.03 AC)=152 CF REQUIRED
VOLUME IN STONE = 818 SF X 0.5 FT = 409 CF X 40% = 164 CF
164CF>152 CF

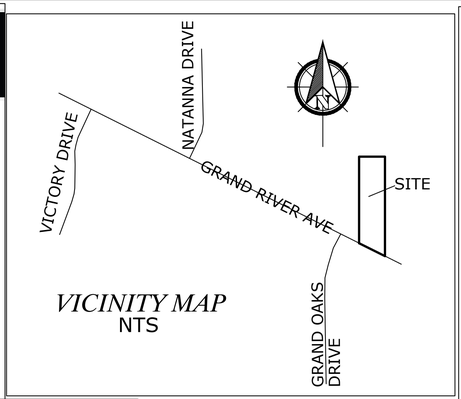
STORAGE PROVIDED IN SAND AND SLOPED STONE AREA WILL BE CONSIDERED SAFETY FACTOR

K9Grass System

Edge Detail - Installed over soil with hard and soft edges

K9Grass®





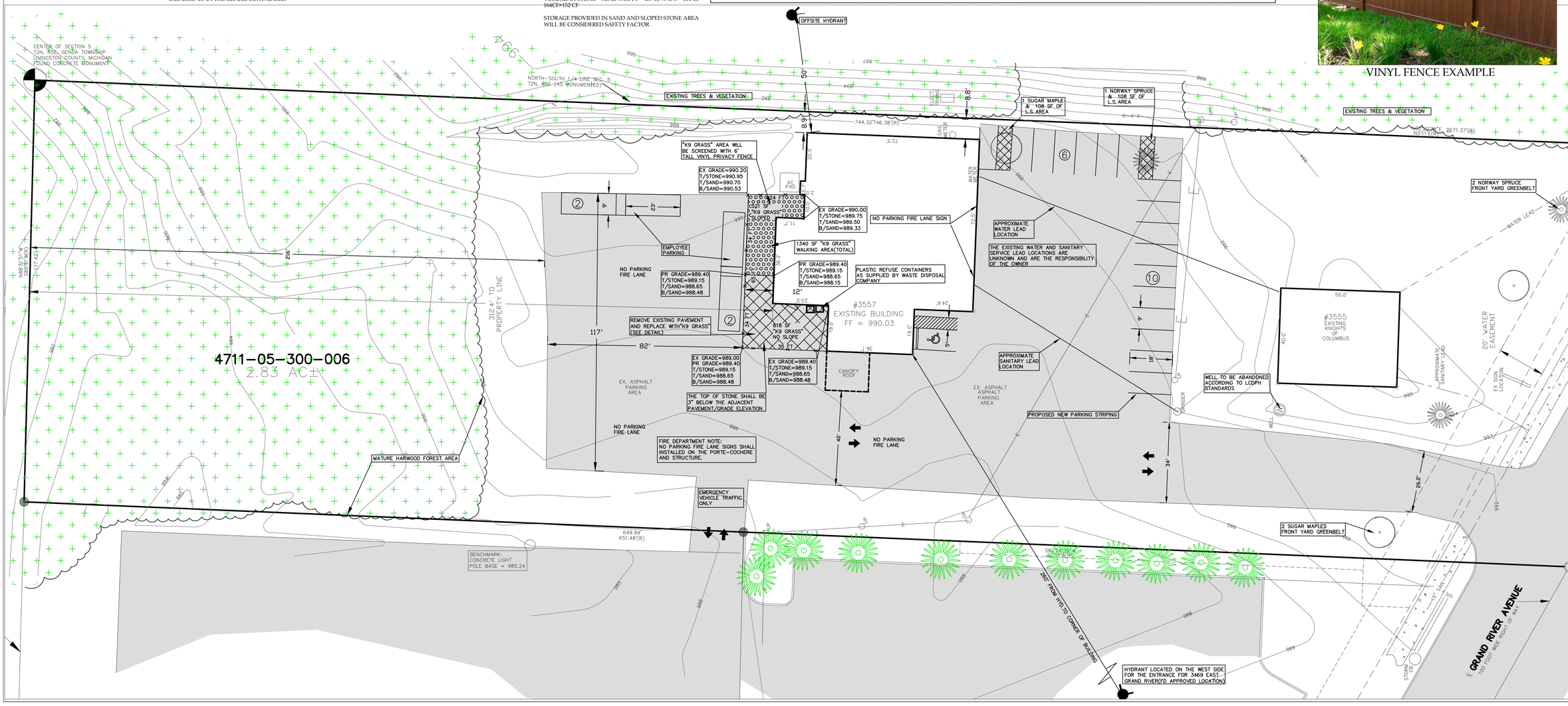
VICINITY MAP
NTS

VINYL FENCE EXAMPLE

Consulting Civil Engineers
"Engineering A Better Michigan"
Powell Engineering & Associates, LLC
4700 Cornerstone Drive, White Lake, Michigan 48383
P: 248.714-9895 info@powellengineeringllc.com

NOTE: AS AN AID TO THE CONTRACTOR VARIOUS UTILITIES AND UNDERGROUND STRUCTURES ARE SHOWN ON THESE PLANS AND PROFILES. ALL INFORMATION CONCERNING ALL UTILITIES SHOWN ON THE PLANS AND PROFILES IS TAKEN FROM FIELD TOPO AND/OR AVAILABLE RECORDS, AND THE ENGINEER DOES NOT GUARANTEE IT IS NOT GUARANTEED AS TO LOCATION/ELEVATION, OR THAT ADDITIONAL UNDERGROUND STRUCTURES OR UTILITIES MAY NOT BE ENCOUNTERED. THE CONTRACTOR SHALL CONTACT ALL PREVIOUSLY UNIDENTIFIED UTILITIES OR STRUCTURE, OR DETERMINES THAT ONE OF THE UTILITIES / STRUCTURES SHOWN ON THESE PLANS IS INCORRECTLY LOCATED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OR ENGINEER FOR DIRECTION ON HOW TO PROCEED. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL DAMAGE TO EXISTING UTILITIES. NOTIFY "MISS DIG" AT 1-800-482-7171, 72 HOURS PRIOR TO THE START OF ANY CONSTRUCTION.

BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171



PET DAYCARE SITE PLAN

PET DAYCARE
GENOA TOWNSHIP

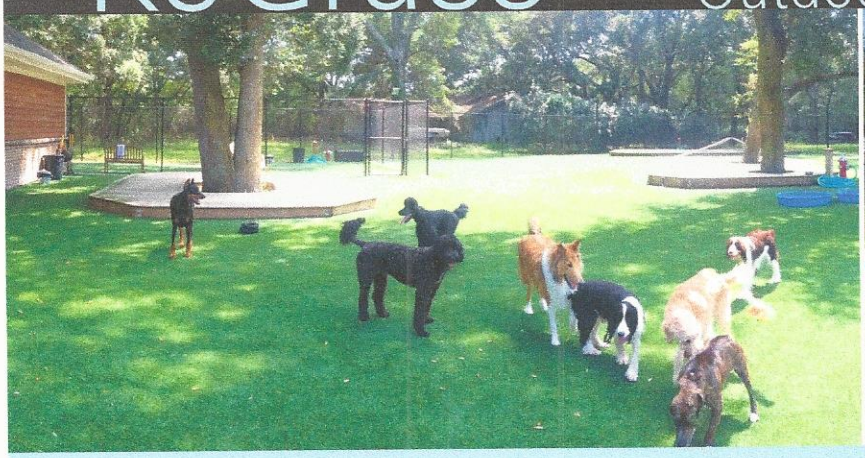
ISSUE DATES

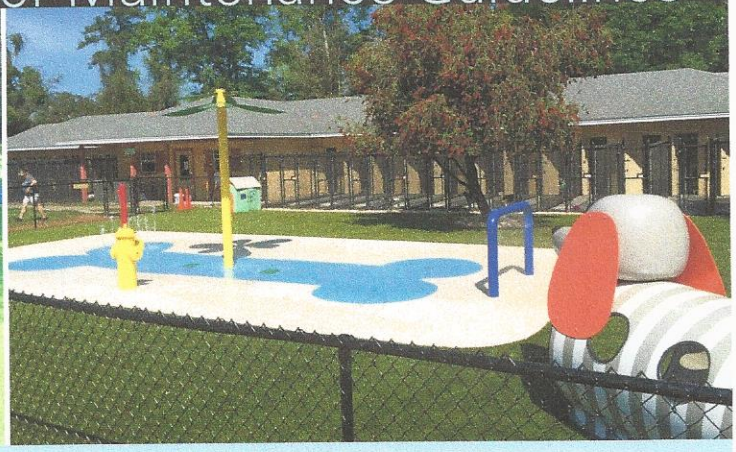
SITE PLAN 7-23-18
SITE PLAN 7-27-18
SITE PLAN 9-6-18
SITE PLAN 9-7-18
FIRE MARSHAL 9-7-18
TOWNSHIP 9-19-18

DRAWN	BBB
DESIGNED	BBB
APPROVED	MCP
P.E. JOB No.	18-454
SCALE	AS-SHOWN

S1

K9Grass Outdoor Maintenance Guidelines





K9Grass®

ForeverLawn®

General Guidelines - Outdoor

Maintenance requirements for K9Grass outdoor installations are typically much less than with most other surfaces. However, proper maintenance is still required and will ensure many years of pet-friendly play. The following general guidelines provide a framework for you to develop a customized protocol for your specific application and desires.

Hair and Debris Removal along with Grass Grooming

K9Grass should be regularly groomed. For smaller applications this can be done manually. However, there are options for appropriately sized equipment that will brush the blades and extract residual debris and hair. A vacuum with a rotating brush and strong suction can be an effective tool. Power brooms and wider commercial grade vacuums are more effective for larger areas. Vacuuming should occur when the grass is dry. Frequency is dependent on use and exposure to hair and debris. Recommendation: vacuum once a week and increase/decrease based on results.

Cleaning

Since K9Grass is made of non-absorbent polyethylene and nylon fibers and contains antimicrobial AlphaSan®, you can be assured that the blades will not stain or retain odor. However, the surface of the blades, the backing, and the area around the grass still needs to be kept clean. K9Grass with its short dense design is a perfect solution.

Solid waste should be removed and disposed of immediately and soiled areas rinsed regularly. It is a good practice to "spot treat" these areas with an enzyme immediately after the waste is removed. It is unwise and not recommended to wash solid waste through the grass.

Required frequency of cleaning is based on multiple variables. Factors such as the number of dogs, the type of use (play or elimination), as well as personal preference should all be considered. Regular rinsing with water will remove much of the residual waste from the blades and will rinse the base material.

Disinfectants are a classification of cleaners that are used to clean (kill germs) the grass, floor, walls, and underlayment material. While "germ kill time" may vary, it is common to leave disinfectant on the surface for 15 minutes prior to being rinsed off. Disinfectants kill germs but they typically do not necessarily eliminate the source of odors (urine and feces).

Enzymes reduce and help eliminate the source of the odor (urine and feces) and should be applied to wet grass after disinfectants have been applied and rinsed off. Enzymes should be applied and left on for anywhere from 4 to 24 hours. While enzymes break down the source of odors, they do not necessarily kill germs. Longer enzyme exposure to organic waste and water will maximize results.

Most cleaning products are safe to use with K9Grass. However, any agent that contains bleach in a solution of greater than 1:20 should not be used. (A 1:32 ratio of bleach to water is sufficient to neutralize Parvovirus). It is recommended that any cleaning product be applied in a small test area first. Water in excess of 160 degrees should not be used on the grass.

The following list is a small sampling of disinfectant cleaning products to get you started:

- Triple 2 made by HTP - Health Technology Professional Products
- WYSIWASH – Available from ForeverLawn
- KennelSol – made by Alpha Tech Pet
- Accel – Accelerated Hydrogen Peroxide
- Bleach (no stronger than 1:20)
- White Distilled Vinegar and Water

The following list is a small sampling of enzyme products to get you started:

- Odor Pet – made by Alpha Tech Pet
- Eliminator – made by HTP – Health Technology Professional Products
- Foreverzyme – available from ForeverLawn
- K9Zyme – available from ForeverLawn West
- Nature's Miracle – available at most pet stores

Other Guidelines

For additional questions regarding the care and maintenance, please contact your local authorized ForeverLawn dealer or ForeverLawn corporate office.

ADDRESS
5801 Mayfair Rd., Suite 4,
North Canton, OH 44720

PHONE
866.992.7876

WEBSITE
k9grass.com

M0090 Rev. 04/15

NORTH

FLOOR PLAN

SCALE: 3/16"=1'-0"

BWA
BRIAN WIGGINS
ARCHITECT
11315 SAN JOSE
REDFORD, MICHIGAN 48239
(313) 937-0832
E-MAIL: BWAARCHITECTURE@ATT.NET

A NEW INTERIOR BUILD-OUT FOR:

DOGGY TOWN AND KITTY CITY PET DAYCARE / BOARDING FACILITY

XXXXX GRAND RIVER AVE.
GENOA TOWNSHIP, MI 48XXX

project:

drawing title:
FLOOR PLAN

issued for / date
- ☐ owner review
- ☐ site plan approval
- ☐ bids
- ☐ permits
- ☐ construction

revisions:
SITE PLAN APPROVAL 08/15/2018

job no.
18125

drawn by: .
checked by: .
date: .

sheet no.
A1
of sheets

do not scale drawings, use written dimensions