DOCKET ITEM #8
Special Use Permit #2016-0028
5261 Eisenhower Avenue
City of Alexandria Police Department Firearms Training Range

Application	**General Data**	
Public hearing and consideration of a request to expand the legal non-complying use of the City of Alexandria Police Firearms Training Range	**Planning Commission Hearing:**	June 9, 2016
	City Council Hearing:	June 18, 2016
Address: 5261 Eisenhower Avenue	**Zone:**	OCM-100/Office Commercial Medium
Applicant: City of Alexandria, Department of General Services	**Small Area Plan:**	Eisenhower West

Staff Recommendation: APPROVAL subject to compliance with all applicable codes and ordinances and the recommended permit conditions found in Section III of this report.
Staff Reviewers: Ann Horowitz, ann.horowitz@alexandriava.gov

Special Use Permit #2016-0028
5261 Eisenhower Avenue

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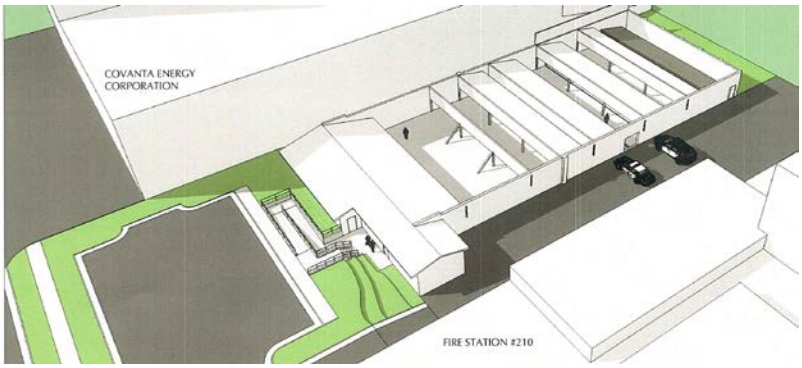
I. DISCUSSION

The applicant, the City of Alexandria, Department of General Services, proposes to expand the Police Department firearms training range, a legal non-complying use at 5261 Eisenhower Avenue, by 1,177 square feet to mitigate the effects of lead exposure on Police employees and trainees.

SITE DESCRIPTION

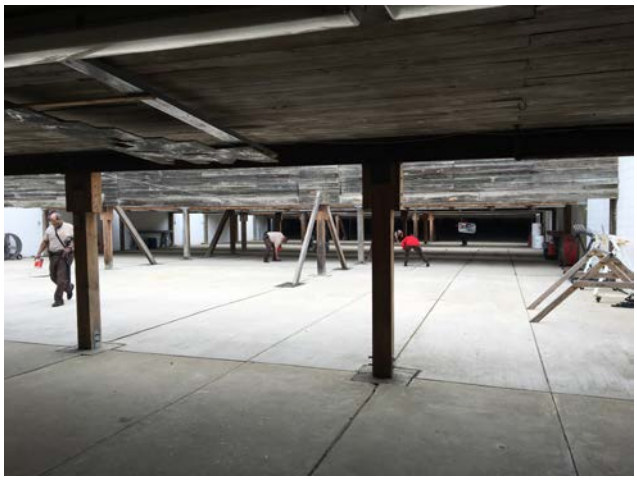
The subject site is one irregularly shaped parcel located at 5261 Eisenhower Avenue. The parcel is developed with the firearms training range, Fire Station #210, and the City Impound Lot. The parcel has 449 feet of frontage on Eisenhower Avenue. The depth of the lot varies between 269 and 345 feet. The lot area is 144,595 square feet.



Current aerial view

Exterior

The range occupies about one-third of the parcel on the western end of the property. It consists of a 14,000 square foot masonry, open-air structure with five wood-frame roof systems, a cantilevered steel-frame projectile trap system, a classroom at the south end of the site, and an office and ammunition storage space in the southeast portion of the site. Two parking lots provide 33 spaces that border the training range structure to the south and east.



Interior

Industrial, commercial, transportation, and residential uses surround the site. The Covanta plant is located to the immediate west, and the fire station and impound lot are to the east. Several warehouses are located to the south and contain a mix of commercial uses, including automobile repair businesses, fitness facilities, and equipment rental operations. The Van Dorn Metro Station is sited farther to the south. The Norfolk Southern

rail lines border the property to the north and separate the firearms training range from Backlick Run and the Cameron Station residential neighborhood. The Summers Grove Condominiums, the Reserve Apartments, and the Exchange Condominiums are also located in the vicinity of the range (Fig. 1).

Fig. 1: Surrounding uses near the site

BACKGROUND

History and Use

City Council approved SUP#746 in September 1968 for an outdoor firearms training range for the Alexandria Police and Fire Departments. Fifteen parking spaces were required. Although some site features have been updated, the overall facility remains largely unchanged. Past renovations have included the replacement of the bullet trap in 2005 and the construction of a stormwater management structure in 2011. As part of DSUP#2011-0033 for the construction of Fire Station #210, the south parking lot and accessway to the range were reconfigured.

The Police Department trains cadets and the current police force on firearm usage and conducts annual state-mandated certification tests at the facility. The Alexandria Sheriff and Fire departments also share the use of the range. The training range is used nearly every day, Monday through Friday. Twenty trainees a day typically practice at the facility during two, eight-hour shifts from 7 a.m. to 4 p.m. and from 2 p.m. to 10 p.m. Firing occurs for four to six hours within the eight-hour training time period. Up to four instructors are present at any one time.

Noise Levels

The City has received noise complaints from residents related to firing during the training sessions, particularly in the early evening hours, when police are receiving critical training for shooting in low-light circumstances. In 2008, acoustical consultants reported that noise levels generated at the range exceeded the City Code requirement of 55 dBA (A-weighted decibel is a measure of relative sound as perceived by the human ear) at the property line. The noise levels were slightly higher than 55 dBA at Ferdinand Day Drive, the closest residential area located in Cameron Station. The consultants cautioned, however, that the dBA measurements in the report should be used only as a general guide and not interpreted for code compliance given that the data sample was limited to a short time period. The sample survey also included ambient noise from passing trains, Virginia Paving, and Covanta.

In response to noise concerns, the applicant has explored options to mitigate noise on-site and to relocate the firearms training range. It has found, however, that these options are not viable at this time. Acoustical changes to the interior of the structure would be costly and would not result in a significant decrease in noise. Additionally, the construction of a new, indoor facility within or outside the City is estimated to cost $15 million, with yearly maintenance fees of $300,000-400,000. This project has not been proposed for Capital Improvement Program (CIP) funding.

Lead Hazards

Firing and shooting ranges are sources of high lead concentrations. The applicant has found that the current layout of the training range does not adequately separate the lead hazard areas associated with shooting, gun cleaning, and ammunition storage from the non-lead related spaces such as the classroom, breakroom, bathroom, and the office areas. The combination of these functions within one structure presents a lead exposure hazard for Police employees and trainees, as well as for their families, when lead dust home is tracked home on clothing.

PROPOSAL

The City of Alexandria, Department of General Services, proposes to expand the Police Department firearms training range by 1,177 square feet, for a total area of 15,177 square feet, to mitigate the effects of lead exposure on Police employees and trainees and their family members. The reconfiguration and addition of floor space would create a strict separation between zones of industrial level lead-related activities and non-lead activities (Figs. 2, 3).

The applicant proposes to narrow the width of the facility, reducing the number of firing lanes from 12 to 10, and to construct an enclosed room near the steel trap end at the northeast corner of the structure, where the highest concentrations of lead are found. This room would function as a new lead management area that would house lead barrel storage and a new dust collector machine, used to extract lead dust from the air at the trap and in the immediate area. At the southeast corner of the existing building, a new room would be constructed, dedicated to the storage of ammunition and lead contaminated training props. An area for cleaning guns and washing hands would also be located in this new addition.

Within the existing range area, narrow overhead precast concrete ballistic baffles would replace large wooden roof structures to improve natural ventilation and enhance ballistic control, reducing the possibility of bullets exiting the range. Other ballistic improvements include the

solid grouting of existing walls and the de-cluttering of the range interior to remove excessive columns and hardware that can unsafely deflect bullets inside and outside the range.

A new wing for non-lead related activities would contain a classroom and an office. The space would also include a shower and laundry to prevent the tracking of lead dust outside the facility and into personal vehicles. The separate wing would be constructed at the south end of the existing structure, 30 feet from the last firing line and six feet higher in elevation. It would be connected to the range area by an outdoor breezeway. Seven parking spaces would be removed from the south parking lot to make way for the new wing, however 11 spaces would remain. A total of 26 parking spaces would be available at the site.

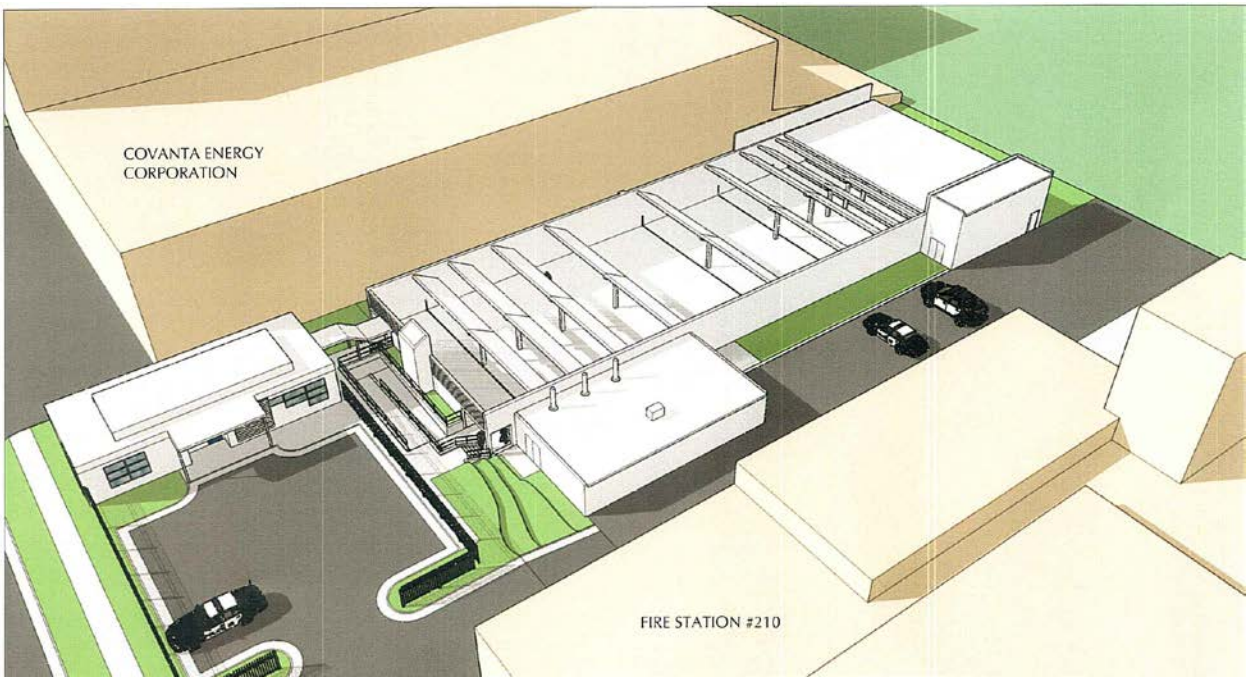


Fig 2: Aerial view of proposed addition

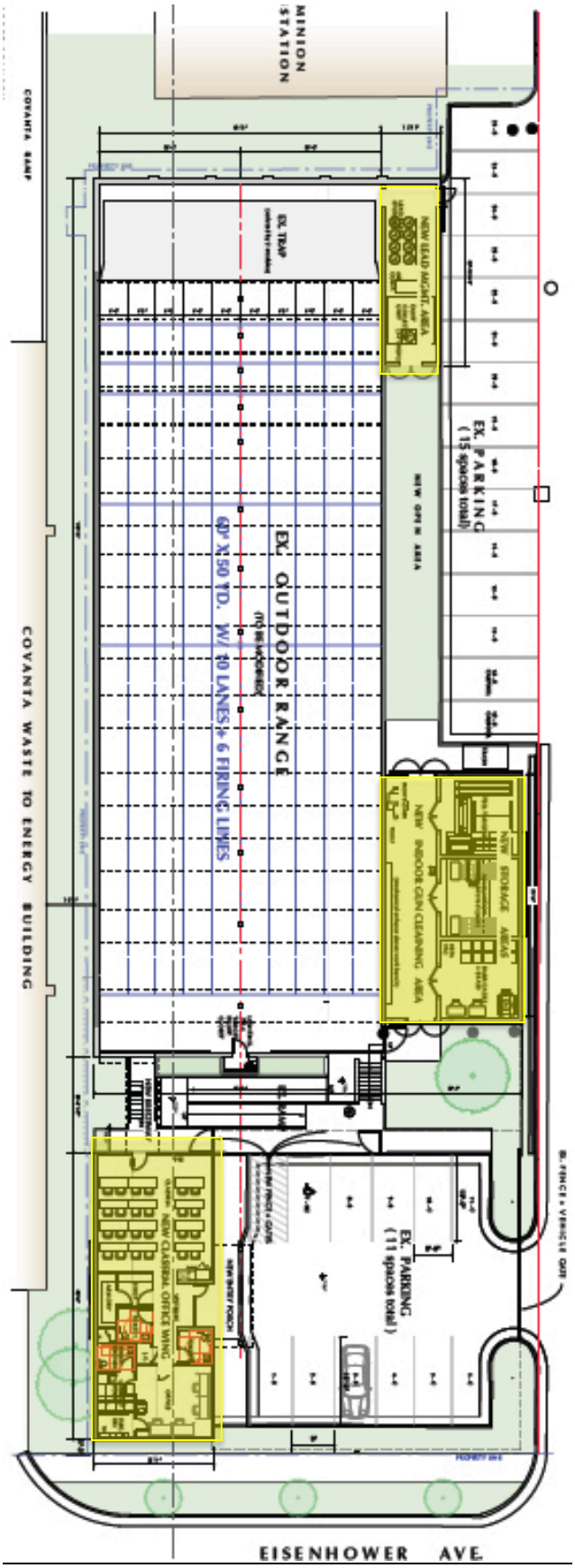


Fig 3: Proposed plan. Additions shaded in yellow.

PARKING

The firearms training range would exceed the 15-space parking requirement, mandated in SUP#746, with 26 spaces provided in the two parking lots. As a practical matter, the off-street parking availability would satisfy the parking usage, as no more than 24 trainees and staff would be at the site at any one time.

ZONING/MASTER PLAN DESIGNATION

At the time SUP#746 was approved for the training range, the facility was located in the I-2/ Industrial Zone. The zone changed to OCM 100/Office Commercial Medium Zone in 1992, and the training range became a legal non-complying use in that zone. Section 12-302 permits non-complying uses to operate indefinitely subject to the restrictions of Section 12-302(A) that require special use permit approval for the physical expansion of a non-complying use.

The site is located in the Eisenhower West Small Area Plan. Although the plan has identified the training range lot as a possible location for the installation of a multi-modal bridge, it has not envisioned redevelopment of the subject parcel. The plan identifies office, institutional, and retail uses as the immediate uses surrounding these facilities. Residential redevelopment would occur outside this commercial area.

II. STAFF ANALYSIS

Staff supports the applicant's request to expand the Alexandria Police Department Firearms Training Range at 5261 Eisenhower Avenue to resolve a critical health and safety issue facing police staff and trainees. Implementation of the proposal would enable the Police Department to continue high quality firearms training and state certification for its officers at this local facility. The distinct separation of spaces associated with lead contamination from the spaces for classroom and office use would mitigate the possibility of lead exposure. Airborne lead dust would be also reduced through the proposed ventilation systems. The inclusion of a laundry and shower in the new wing would minimize the transfer of lead dust from the firing range to homes and families. Additionally, ballistics enhancements would not only create a safer working environment for police, but also would reduce the possibility of stray bullets exiting the range.

Although staff recognizes residents' concerns related to high levels of noise when shooting occurs, it also respects Police Department obligations to effectively train new officers, to fulfill the state mandate for yearly firearms certifications, and to maintain a safe working environment at its existing outdoor facility. Given that costs involved to relocate and construct a new, indoor facility are not budgeted and that the Eisenhower West Small Area Plan generally acknowledges that the training range would likely remain in place, staff believes that support of safety improvements proposed at the existing site are essential at this time.

Civic and condominium organizations were invited to comment on the applicant's SUP proposal at community meetings scheduled on March 3rd and May 10th. Although concerns were not expressed at these meetings, another community meeting is scheduled for June 1st at 7 p.m. The Police Department acknowledges resident concerns and has offered to reduce noise impacts by training between Monday through Friday only; beginning low-light shooting exercises as early in

the day as possible to reduce noise later in the evening; and consolidating the schedule for the patrol rifle training (one of the loudest firearms) during February and March rather than throughout the year.

In summary, staff recommends Special Use Permit approval for the proposed expansion of the Firearms Training Range, subject to the condition language found in Section III of this report.

III. RECOMMENDED CONDITIONS

Staff recommends **approval** subject to compliance with all applicable codes and ordinances and the following conditions:

1. The Special Use Permit shall be granted to the applicant only or to any business or entity in which the applicant has a controlling interest. (P&Z)

2. The applicant shall conduct employee training sessions on an ongoing basis, including as part of any employee orientation, to discuss all SUP provisions and requirements. (P&Z)

3. Trash and garbage shall be placed in sealed containers which do not allow odors to escape and shall be stored inside or in closed containers which do not allow invasion by animals. No trash or debris shall be allowed to accumulate on site outside of those containers. (P&Z)

4. No permanent structure may be constructed over any existing private and/or public utility easements. It is the responsibility of the applicant to identify any and all existing easements on the plan. (T&ES)

5. Indicate whether or not there is any known soil and groundwater contamination present on the plan. The applicant must submit supporting reports for associated environmental investigations or assessments performed to substantiate this determination. (T&ES)

6. If environmental site assessments or investigations discover the presence of contamination on site, the final plan shall not be released, and no construction activity shall take place until the following has been submitted and approved by the Director of T&ES:
    a. Submit a Site Characterization Report/Extent of Contamination Study detailing the location, applicable contaminants, and the estimated quantity of any contaminated soils and/or groundwater at or in the immediate vicinity of the site.

    b. Submit a Risk Assessment indicating any risks associated with the contamination.

    c. Submit a Remediation Plan detailing how any contaminated soils and/or groundwater will be dealt with, including plans to remediate utility corridors. Utility corridors in contaminated soil shall be over excavated by 2 feet and backfilled with “clean” soil. Include description of environmentally sound methods of off-site transport and disposal of contaminated soils and debris

(including, but not limited to types of vehicles appropriate for handling specific materials and ensuring vehicle loads are covered).

d. Submit a Health and Safety Plan indicating measures to be taken during remediation and/or construction activities to minimize the potential risks to workers, the neighborhood, and the environment. Initial Air Monitoring may be required during site activities to demonstrate acceptable levels of volatiles and/or airborne particles. The determination whether air monitoring is needed must be adequately addressed in the Health and Safety Plan submitted for review.

e. The applicant shall screen for PCBs as part of the site characterization if any of the past uses are within the identified high risk category sites for potential sources of residual PCBs, which includes the following SICs: 26&27 (Paper and Allied Products), 30 (Rubber and Misc. Plastics), 33 (Primary Metal Industries), 34 (Fabricated Metal Products), 37 (Transportation Equipment), 49 (Electrical, Gas, and Sanitary Services), 5093 (Scrap Metal Recycling), and 1221&1222 (Bituminous Coal).

f. Applicant shall submit three (3) electronic and two (2) hard copies of the above. The remediation plan must be included in the Final Plan. * (T&ES)

7. Should any unanticipated contamination, underground storage tanks, drums or containers be encountered at the site during construction, the Applicant must immediately notify the City of Alexandria Department of Transportation and Environmental Services, Office of Environmental Quality. Should unanticipated conditions warrant, construction within the impacted area shall be stopped until the appropriate environmental reports identified in a. through f. above are submitted and approved at the discretion of the Director of Transportation and Environmental Services. This shall be included as a note on the final plan. (T&ES)

8. The Director of Planning and Zoning shall review the Special Use Permit one year after approval and shall docket the matter for consideration by the Planning Commission and City Council if (a) there have been documented violations of the permit conditions which were not corrected immediately, constitute repeat violations or which create a direct and immediate adverse zoning impact on the surrounding community; (b) the Director has received a request from any person to docket the permit for review as a result of a complaint that rises to the level of a violation; or (c) the Director has determined that there are problems with the operation of the use and that new or revised conditions are needed. (P&Z)

STAFF: Alex Dambach, Division Chief, Land Use Regulatory Services,
Department of Planning and Zoning;
Ann Horowitz, Urban Planner.

Staff Note: In accordance with section 11-506(c) of the zoning ordinance, construction or operation shall be commenced and diligently and substantially pursued within 18 months of date of granting of a special use permit by City Council or the special use permit shall become void.

IV. CITY DEPARTMENT COMMENTS

Legend: C - code requirement R - recommendation S - suggestion F - finding

Transportation & Environmental Services:

Findings:

F-1 The required plan submission may be made as an amendment to PLT2008-00018. (T&ES)

F-2 T&ES/OEQ has received two complaints from residents within the last year about noise from this shooting range in its present configuration. (T&ES)

F-3 Future residential and mixed use development is planned under the Eisenhower West SAP in the vicinity of this site. Additional noise mitigation should be explored, to include noise reduction features in the proposed modifications as suggested in the noise study attached in this SUP application. (T&ES)

F-4 During the Eisenhower West Small Area Plan planning process, staff identified a number of potential alignments for the multimodal bridge. During this process, staff coordinated with the property owner to discuss what would be needed should the preferred alignment of the multimodal bridge affect the location of the existing shooting range. Norfolk Southern is in the process of preparing an analysis of potential alignments that could be accommodated. Until staff has more information based on the results of their study, the applicant should be aware that an alignment through the property is still under consideration. (T&ES)

Conditions:

1. No permanent structure may be constructed over any existing private and/or public utility easements. It is the responsibility of the applicant to identify any and all existing easements on the plan. (T&ES)

2. Indicate whether or not there is any known soil and groundwater contamination present on the plan. The applicant must submit supporting reports for associated environmental investigations or assessments performed to substantiate this determination. (T&ES)

3. If environmental site assessments or investigations discover the presence of contamination on site, the final plan shall not be released, and no construction activity shall take place until the following has been submitted and approved by the Director of T&ES:
    a. Submit a Site Characterization Report/Extent of Contamination Study detailing the location, applicable contaminants, and the estimated quantity of any contaminated soils and/or groundwater at or in the immediate vicinity of the site.
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methods of off-site transport and disposal of contaminated soils and debris (including, but not limited to types of vehicles appropriate for handling specific materials and ensuring vehicle loads are covered).

d. Submit a Health and Safety Plan indicating measures to be taken during remediation and/or construction activities to minimize the potential risks to workers, the neighborhood, and the environment. Initial Air Monitoring may be required during site activities to demonstrate acceptable levels of volatiles and/or airborne particles. The determination whether air monitoring is needed must be adequately addressed in the Health and Safety Plan submitted for review.
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f. Applicant shall submit three (3) electronic and two (2) hard copies of the above. The remediation plan must be included in the Final Plan. * (T&ES)

4. Should any unanticipated contamination, underground storage tanks, drums or containers be encountered at the site during construction, the Applicant must immediately notify the City of Alexandria Department of Transportation and Environmental Services, Office of Environmental Quality. Should unanticipated conditions warrant, construction within the impacted area shall be stopped until the appropriate environmental reports identified in a. through f. above are submitted and approved at the discretion of the Director of Transportation and Environmental Services. This shall be included as a note on the final plan. (T&ES)

City Code Requirements:

C-1 The applicant shall comply with the City of Alexandria's Noise Control Code, Title 11, Chapter 5, which sets the maximum permissible noise level as measured at the property line. (T&ES)

C-2 A GRADING PLAN showing all improvements and alterations to the site shall be required prior to any land disturbing activities of 2500 square feet or greater. The grading plan must be approved prior to issuance of a building permit. (5-6-224) (T&ES)

C-3 An erosion and sediment control plan must be approved by T&ES prior to any land disturbing activity greater than 2500 square feet. (Sec.5-4-1.1) (T&ES)

C-4 The applicant shall comply with the provisions of the City's Environmental Management Ordinance (Article XIII of the City's Zoning Ordinance) current at the time of plan submittal. (T&ES)

C-5 All improvements to the city right-of-way such as curbing, sidewalk, driveway aprons, etc. must be city standard design. (Sec.5-2-1) (T&ES)

C-6 Roof, surface and sub-surface drains shall be connected to the public storm sewer system, if available, by continuous underground pipe. Where storm sewer is not available applicant must provide a design to mitigate impact of stormwater drainage onto adjacent properties and to the satisfaction of the Director of Transportation & Environmental Services. (Sec.5-6-224) (T&ES)

C-7 All secondary utilities serving this site shall be placed underground. (Sec. 5-3-3) (T&ES)

C-8 Any work within the right-of-way requires a separate permit from T&ES. (Sec. 5-361) (T&ES)

Code Enforcement:

F-1 The following comments are for SUP review only. Once the applicant has filed for a building permit and additional information has been provided, code requirements will be based upon the building permit plans and the additional information submitted. If there are any questions, the applicant may contact Charles Cooper, Plan Review Division at Charles.cooper@alexandriava.gov or 703-746-4197.

C-1 A building permit review is required for this proposal.

C-2 New construction must comply with the current edition of the Uniform Statewide Building Code (USBC).

C-3 A new certificate of occupancy will be required prior to this business operating.

Fire:
No comments received

Health:
No comments

Parks and Recreation:
No comments received

Police Department:
No comments received

APPLICATION
SPECIAL USE PERMIT

SPECIAL USE PERMIT # 2016-0028

PROPERTY LOCATION: 5261 EISENHOWER AVE.

TAX MAP REFERENCE: #068.03-01-13 **ZONE:** OCM

APPLICANT:

Name: CITY OF ALEXANDRIA, DEPT. OF GENERAL SERVICES, c/o IRINA JAMISON

Address: 110 N. ROYAL ST. SUTIE 300 ALEXANDRIA VA 22314

PROPOSED USE: OUTDOOR SHOOTING RANGE FOR THE ALEXANDRIA POLICE DEPARTMENT

☒ **THE UNDERSIGNED**, hereby applies for a Special Use Permit in accordance with the provisions of Article XI, Section 4-11-500 of the 1992 Zoning Ordinance of the City of Alexandria, Virginia.

☒ **THE UNDERSIGNED**, having obtained permission from the property owner, hereby grants permission to the City of Alexandria staff and Commission Members to visit, inspect, and photograph the building premises, land etc., connected with the application.

☒ **THE UNDERSIGNED**, having obtained permission from the property owner, hereby grants permission to the City of Alexandria to post placard notice on the property for which this application is requested, pursuant to Article IV, Section 4-1404(D)(7) of the 1992 Zoning Ordinance of the City of Alexandria, Virginia.

☒ **THE UNDERSIGNED**, hereby attests that all of the information herein provided and specifically including all surveys, drawings, etc., required to be furnished by the applicant are true, correct and accurate to the best of their knowledge and belief. The applicant is hereby notified that any written materials, drawings or illustrations submitted in support of this application and any specific oral representations made to the Director of Planning and Zoning on this application will be binding on the applicant unless those materials or representations are clearly stated to be non-binding or illustrative of general plans and intentions, subject to substantial revision, pursuant to Article XI, Section 11-207(A)(10), of the 1992 Zoning Ordinance of the City of Alexandria, Virginia.

WILLIAM HENDRICKS — Print Name of Applicant or Agent

Signature — 03.14.16 Date

2107 MT. VERNON AVE. — Mailing/Street Address

703-519-3915 — Telephone # — Fax #

ALEXANDRIA VA 22301 — City and State — Zip Code

WHH@LKHARCHITECTS.COM — Email address

ACTION-PLANNING COMMISSION: _____ **DATE:** _____

ACTION-CITY COUNCIL: _____ **DATE:** _____

SUP # 2016-0028

PROPERTY OWNER'S AUTHORIZATION

As the property owner of 5261 EISENHOWER AVE. ALEXANDRIA VA 22304 (Property Address), I hereby grant the applicant authorization to apply for the OUTDOOR SHOOTING RANGE (use) use as described in this application.

Name: ALEXANDRIA CITY DEPT. OF GENERAL SERVICES c/o IRINA JAMISON Phone 703-746-3209

Please Print

Address: 110 N. ROYAL ST. SUITE 300 ALEXANDRIA VA 22314 Email: IRINA.JAMISON@ALEXANDRIAVA.GOV

Signature: Irina Jamison **Date:** 03/14/2016

1. Floor Plan and Plot Plan. As a part of this application, the applicant is required to submit a floor plan and plot or site plan with the parking layout of the proposed use. The SUP application checklist lists the requirements of the floor and site plans. The Planning Director may waive requirements for plan submission upon receipt of a written request which adequately justifies a waiver.

[X] Required floor plan and plot/site plan attached.

[ ] Requesting a waiver. See attached written request.

2. The applicant is the *(check one)*:

[X] Owner

[ ] Contract Purchaser

[ ] Lessee or

[ ] Other: _____ of the subject property.

State the name, address and percent of ownership of any person or entity owning an interest in the applicant or owner, unless the entity is a corporation or partnership, in which case identify each owner of more than ten percent.

CITY OF ALEXANDRIA DEPARTMENT OF GENERAL SERVICES, 110 N. ROYAL ST. SUTIE 300 ALEXANDRIA VA 22314

OWNERSHIP AND DISCLOSURE STATEMENT

Use additional sheets if necessary

1. Applicant. State the name, address and percent of ownership of any person or entity owning an interest in the applicant, unless the entity is a corporation or partnership, in which case identify each owner of more than ten percent. The term ownership interest shall include any legal or equitable interest held at the time of the application in the real property which is the subject of the application.

Name	Address	Percent of Ownership
1. CITY OF ALEXANDRIA	110 N. ROYAL ST. STE. 300 ALEX. VA 22314	100%
2.		
3.		

2. Property. State the name, address and percent of ownership of any person or entity owning an interest in the property located at 5261 EISENHOWER AVE. ALEXANDRIA VA 22304 (address), unless the entity is a corporation or partnership, in which case identify each owner of more than ten percent. The term ownership interest shall include any legal or equitable interest held at the time of the application in the real property which is the subject of the application.

Name	Address	Percent of Ownership
1. CITY OF ALEXANDRIA	110 N. ROYAL ST. STE. 300 ALEX. VA 22314	100%
2.		
3.		

3. Business or Financial Relationships. Each person or entity indicated above in sections 1 and 2, with an ownership interest in the applicant or in the subject property are require to disclose **any** business or financial relationship, as defined by Section 11-350 of the Zoning Ordinance, existing at the time of this application, or within the12-month period prior to the submission of this application with any member of the Alexandria City Council, Planning Commission, Board of Zoning Appeals or either Boards of Architectural Review. **All fields must be filled out completely. Do not leave blank. (If there are no relationships please indicated each person or entity and "None" in the corresponding fields).**

For a list of current council, commission and board members, as well as the definition of business and financial relationship, click here.

Name of person or entity	Relationship as defined by Section 11-350 of the Zoning Ordinance	Member of the Approving Body (i.e. City Council, Planning Commission, etc.)
1. CITY OF ALEXANDRIA	NONE	
2.		
3.		

NOTE: Business or financial relationships of the type described in Sec. 11-350 that arise after the filing of this application and before each public hearing must be disclosed prior to the public hearings.

As the applicant or the applicant's authorized agent, I hereby attest to the best of my ability that the information provided above is true and correct.

03.14.16 — Date

WILLIAM HENDRICKS — Printed Name

Signature

SUP # 2016-0028

If property owner or applicant is being represented by an authorized agent such as an attorney, realtor, or other person for which there is some form of compensation, does this agent or the business in which the agent is employed have a business license to operate in the City of Alexandria, Virginia?

[X] **Yes.** Provide proof of current City business license

[ ] **No.** The agent shall obtain a business license prior to filing application, if required by the City Code.

NARRATIVE DESCRIPTION

3. The applicant shall describe below the nature of the request **in detail** so that the Planning Commission and City Council can understand the nature of the operation and the use. The description should fully discuss the nature of the activity. (Attach additional sheets if necessary.)

The City of Alexandria was granted an SUP on Sept. 3 of 1968 (SUP 746) to build and operate an outdoor firing range for the Alexandria Police Department (APD) at its current site and footprint in the I-2 / Heavy Industrial Zone. Since 1992, when the zone was changed to OCM 100 / Office Commercial Medium, the firing range has been operating as a legal non-complying use. The proposed renovations require changes to the existing footprint and therefore the applicant is requesting a special use permit for the expansion of a non-complying use.

APD uses this existing facility to train cadets and the current force on usage of their firearms, and most importantly tests them for annual state mandated certification. Alexandria Sheriff's Office, Code Enforcement and other groups also share in incidental use of the range. Weapons typically used in training are Glock Model 23 .40 S&W Pistols, Remington 870 12 gauge shot guns and .223 Patrol Rifles. Approximately 300K to 400K rounds of ammunition are used per year. Training days are largely built around officer availability and on days and times described elsewhere in this application. This type of outdoor range is known in the shooting range industry as an open air, walk down, fixed firing line / lane range, with a total containment steel bullet trap system.

The fundamental goals of the renovation project are to resolve some lead issues affecting the staff + their families, to enhance some of the ballistic ratings of the range structure and to maintain the existing level of certification, training and skills capabilities that APD provides their officers.

To address the lead issues, the proposal creates better separation between zones of industrial level lead activities, lead related activities and strictly non lead activities. At the steel trap end of the range, where highest concentrations of lead are found, a dust collector machine will be added in an enclosed room to extract lead dust from the air at the trap and the immediate area. On the range itself, narrow overhead precast concrete ballistic baffles will replace large wooden roof structures to allow for better natural ventilation, while providing better ballistic control from bullets leaving the range. Dedicated storage for lead contaminated props used on the range will be built to the east along with an area for cleaning guns and washing hands. Finally, in the parking lot 30 feet from the last firing line to the south and at an elevation 6 feet higher then the range, a new Classroom / Office Wing will be built for non lead related activities. In addition to matching the programmed spaces in APD's existing facility, this wing will have a shower and laundry to help staff prevent tracking lead dust into their personal vehicles.

Aside from the new precast concrete overhead baffles, other ballistic enhancements include the solid grouting of existing walls where reused and the de-cluttering of the interior of the range of bullet deflection points such as excessive columns/ hardware, a trench drain and a garage door. The dedicated storage area will also aid in this objective.

The configuration of the existing range is slightly modified, expanding the length southwards to compensate for the deeper steel trap (recently replaced) and reducing the range width from 12 lanes to 10 to better accommodate program changes and structural span demands.

With the approval of this special use permit, APD will be able to make this facility safer for its employees, trainees and surrounding neighbors. It will also enable them to continue training and certifying their officers at this local facility, to the highest level of dedication and service .

SUP # 2016-0028

USE CHARACTERISTICS

4. The proposed special use permit request is for *(check one)*:

[ ] a new use requiring a special use permit,
[ ] an expansion or change to an existing use without a special use permit,
[X] an expansion or change to an existing use with a special use permit,
[ ] other. Please describe:_____

5. Please describe the capacity of the proposed use:

A. How many patrons, clients, pupils and other such users do you expect?
Specify time period (i.e., day, hour, or shift).
THE TYPICAL DAY HAS 20 TRAINEES WHO SHOOT ON THE RANGE IN 2 RELAYS OF 10 INDIVIDUALS.
EACH SESSION IS 8 HOURS LONG WITH SHOOTING OCCURING FOR 4-6 HOURS DURING THE TIME WINDOW
OF EITHER 7 AM TO 4 PM OR 2 PM TO 10 PM.

B. How many employees, staff and other personnel do you expect?
Specify time period (i.e., day, hour, or shift).
3-4 INSTRUCTORS ONE OF WHOM IS DESIGNATED A RANGE MANAGER, WORK THE HOURS STATED ABOVE.

6. Please describe the proposed hours and days of operation of the proposed use:

Day:	Hours:
M-F	7 AM TO 4 PM OR 2 PM TO 10 PM

7. Please describe any potential noise emanating from the proposed use.

A. Describe the noise levels anticipated from all mechanical equipment and patrons.

REFER TO NOISE STUDY FROM 2008, THE SAME WEAPONS WILL BE USED AS THEN. (ATTACHED)

A NEW MECHANICAL DEVICE CALLED A DUST COLLECTOR UNIT WILL BE ADDED TO THE SITE IN AN ENLCOSED RM. ROOFTOP UNITS OR MINI SPLIT HEAT PUMPS WILL BE UTLIZED FOR CONDITIONING OCCUPIED SPACES.

B. How will the noise be controlled?

NOISE MITIGATION IS NOT APART OF THE SCOPE OF THIS PROJECT

SUP # 2016-0028

8. Describe any potential odors emanating from the proposed use and plans to control them:

TYPICAL RANGE ACTIVITIES INVOLVE THE BURNING OF GUN POWDER + USE OF GUN CLEANING SOLVENTS

NATURAL AND MECHANICAL VENTILATION METHODS ARE USED TO DISPERSE THESE ODORS IN A SAFE MANNER.

9. Please provide information regarding trash and litter generated by the use.

A. What type of trash and garbage will be generated by the use? (i.e. office paper, food wrappers)

TYPICAL OFFICE PAPER AND LUNCH WRAPPER TRASH AS WELL AS CARDBOARD AMMUNITION CARTOONS

B. How much trash and garbage will be generated by the use? (i.e. # of bags or pounds per day or per week)

A 4 YARD DUMPSTER IS FILLED TWICE A MONTH.

C. How often will trash be collected?

THE DUMPSTER IS COLLECTED EVERY OTHER WEEK.

D. How will you prevent littering on the property, streets and nearby properties?

THE CITY EMPLOYS CREWS TO TEND TO MAINTENANCE OF POLICE FACILITY GROUNDS.

10. Will any hazardous materials, as defined by the state or federal government, be handled, stored, or generated on the property?

[X] Yes. [ ] No.

If yes, provide the name, monthly quantity, and specific disposal method below:

A SHOOTING RANGE HAS AREAS OF HIGH LEAD ACTIVITY COMPARABLE TO OTHER MANUFACTURING PROCESSES WHERE LEAD OR OTHER HAZMAT IS INVOLVED. SEVERAL 55 GA. BARRELS ARE FILLED ABOUT HALF FULL WITH SPENT AMMUNITION THAT IS COLLECTED FROM THE STEEL BULLET TRAP CONTAINMENT SYSTEM. THESE BARRELS ARE THEN REMOVED FROM THE SITE ABOUT 3-4 TIMES A YEAR. THE POLICE DEPARTMENT CONTRACTS A SPECIAL ENVIROMENTAL SERVICES COMPANY TO COLLECT THE MATERIAL FROM THE TRAP + LEAD MANAGEMENT AREA AND DISPOSE OF THE HAZARDOUS MATERIALS ACCORDING TO GOVERNING LAWS. THE ACTIVITIES BY THESE CONTRACTORS UTILIZE A LARGE AMOUNT OF PERSONAL PROTECTIVE EQUIPMENT (PPE) AND HEPA VACUUMS.

ADDITIONALLY , IN AREAS NOT REQUIRING PPE, CLEANING ACTIVITIES BY OTHER CONTRACTORS ARE PERFORMED WEEKLY. VACUUMING, MOPPING AND OFF SITE LAUNDRY SERVICE HELP MITIGATE BUILD UP OF LEAD DUST IN AREAS NOT SPECIFICALLY DESIGNED FOR THE ACCUMULATION OF LEAD.

SUP # 2016-0028

11. Will any organic compounds, for example paint, ink, lacquer thinner, or cleaning or degreasing solvent, be handled, stored, or generated on the property?

[X] Yes. [ ] No.

If yes, provide the name, monthly quantity, and specific disposal method below:

SMALL CLOTH RAGS WITH GUN CLEANING SOLVENTS ARE SEALED IN CANS TO PREVENT COMBUSTION AND DISPOSED ACCORDING TO GOVERNING RULES.

12. What methods are proposed to ensure the safety of nearby residents, employees and patrons?

FOLLOWING STANDARD INDUSTRY SAFETY PROCEDURES FOR SHOOTING RANGES ARE CRITICAL TO OPERATING IN A SAFE MANNER. SUCCESS BEGINS WITH PROPER ADMINISTRATIVE CONTROLS BY THE THE RANGE MANAGER AND INSTRUCTOR TEAMS TO ENSURE THAT WEAPONS ARE USED CORRECTLY. SECOND, THE RANGE WILL BE BALLISTICALLY ENHANCED TO PREVENT INTENTIONAL BUT MISDIRECTED FIRE FROM LEAVING THE RANGE. THIRD THE USE OF PPE OR OTHER EQUIPMENT IN AREAS THAT EXCEED PERMITTED OSHA LEVELS ARE REQUIRED FOR LEAD, NOISE, FUMES AND DANGER OF PROJECTILES TO EYES. FINALLY, RAIN WATER FILTRATION SYSTEMS ARE USED ON THE SITE TO PREVENT LEAD FROM ENTERING AQUIFERS.

ALCOHOL SALES

13.

A. Will the proposed use include the sale of beer, wine, or mixed drinks?

[ ] Yes [X] No

If yes, describe existing (if applicable) and proposed alcohol sales below, including if the ABC license will include on-premises and/or off-premises sales.

NOT APPLICABLE

SUP # 2016-0028

PARKING AND ACCESS REQUIREMENTS

14. A. How many parking spaces of each type are provided for the proposed use:

29 EXISTING	23 PROPOSED	Standard spaces
NA		Compact spaces
2 EXISTING	1 PROPOSED	Handicapped accessible spaces.
2 EXISTING	2 PROPOSED	Other. CARPOOL

Planning and Zoning Staff Only

Required number of spaces for use per Zoning Ordinance Section 8-200A_____

Does the application meet the requirement?

[ ] Yes [ ] No

B. Where is required parking located? *(check one)*

[x] on-site

[ ] off-site

If the required parking will be located off-site, where will it be located?

_____

PLEASE NOTE: Pursuant to Section 8-200 (C) of the Zoning Ordinance, commercial and industrial uses may provide off-site parking within 500 feet of the proposed use, provided that the off-site parking is located on land zoned for commercial or industrial uses. All other uses must provide parking on-site, except that off-street parking may be provided within 300 feet of the use with a special use permit.

C. If a reduction in the required parking is requested, pursuant to Section 8-100 (A) (4) or (5) of the Zoning Ordinance, complete the PARKING REDUCTION SUPPLEMENTAL APPLICATION.

[ ] Parking reduction requested; see attached supplemental form

15. Please provide information regarding loading and unloading facilities for the use:

A. How many loading spaces are available for the use? NONE

Planning and Zoning Staff Only

Required number of loading spaces for use per Zoning Ordinance Section 8-200_____

Does the application meet the requirement?

[ ] Yes [ ] No

SUP # 2016-0028

B. Where are off-street loading facilities located? NONE, HOWEVER THE NORTH EAST PARKING AREA CURRENTLY SERVES FOR DELIVIERIES AND PICK UPS

C. During what hours of the day do you expect loading/unloading operations to occur?
NORMAL BUSINESS HOURS (8-5) AND ONLY WHEN THE RANGE IS STAFFED

D. How frequently are loading/unloading operations expected to occur, per day or per week, as appropriate?

THE DELIVERY OF AMMUNITION PALLETES OCCURS 1-2 TIMES A YEAR AND PICK UP OF SPENT AMMUNITION BARRELS OCCURS 3-4 TIMES A YEAR

16. Is street access to the subject property adequate or are any street improvements, such as a new turning lane, necessary to minimize impacts on traffic flow?

THE SITE IS SHARED WITH THE NEW FIRE STATION 210. AN EMERGENCY VEHICLE EASMENT PROVIDES VEHICULAR ACCESS TO BOTH FACILITIES. THE USE BY APD IS COMMENSURATE WITH THAT OF THE FIRE DEPARTMENT AND A CONFLICT IS NOT ANTICIPATED. EXISITNG LEVELS OF TRAFFIC USAGE PER THE FIRE STATION DSUP ARE EXPECTED TO BE MAINTAINED.

SITE CHARACTERISTICS

17. Will the proposed uses be located in an existing building? [✓] Yes [ ] No

Do you propose to construct an addition to the building? [X] Yes [ ] No

How large will the addition be? 1,177 NET SF OF ENCLOSED FOOTPRINT

18. What will the total area occupied by the proposed use be?

14,000 sq. ft. (existing) + 1,177 sq. ft. (addition if any) = 15,177 sq. ft. (total)

19. The proposed use is located in: *(check one)* +130 SF Breezeway

[X] a stand alone building
[ ] a house located in a residential zone
[ ] a warehouse
[ ] a shopping center. Please provide name of the center: _____
[ ] an office building. Please provide name of the building: _____
[ ] other. Please describe: _____

End of Application

FIRE STATION 210

EX. EMERGENCY VEHICLE EASMENT

EX. FENCE + VEHICLE GATE

EX. PARKING
(15 spaces total)

STORAGE 2
(shipping container)

STORAGE 1
(shipping container)

OFFICE

CHECK + CLEAN

CLASSROOM

CONTROL

TRAP

EX. OUTDOOR RANGE

72' X 45 YD. W/ 12 LANES + 6 FIRING LINES

EX. PARKING
(18 spaces total)

PARKING

EISENHOWER AVE.

COVANTA RAMP

COVANTA WASTE TO ENERGY BUILDING

① DEMOLITION PLAN

AREA TO BE REMOVED, INCLUDING ROOFING, STRUCTURE
WALLS AND SLAB IN PREPARATION FOR HEAVY CONSTRUCTION

② DEMOLITION SECTION

EXISTING

1 LEVEL

LKH LARSON/KOENIG / HENDRICKS ARCHITECTS PROJECT 1508 © 2016 ALEXANDRIA POLICE DEPT. ~ FIREARMS TRAINING RANGE 5261 EISENHOWER AVE ALEXANDRIA, VA 22304 100% SCHEMATIC DESIGN MAY 16, 2016 A 2.0

REVISED

FIRE STATION 210

EX. EMERGENCY VEHICLE EASMENT

EX. FENCE + VEHICLE GATE

EX. PARKING
(15 spaces total)

NEW STORAGE AREAS

NEW INDOOR GUN CLEAINING AREA

NEW LEAD MGMT. AREA

NEW OPEN AREA

EX. PARKING
(11 spaces total)

DOMINION SUBSTATION

EX. TRAP

EX. OUTDOOR RANGE

(TO BE MODIFIED)

60' X 50 YD. W/ 10 LANES + 6 FIRING LINES

EX. RAMP

NEW FENCE + GATES

NEW ENTRY PORCH

NEW CLASSRM. OFFICE WING

NEW BREEZEWAY

EISENHOWER AVE.

COVANTA RAMP

COVANTA WASTE TO ENERGY BUILDING

SCOPE OF WORK

NEW CLASSRM. OFFICE WING: NEW FULLY TEMPERED AND CONDITIONED SPACE ON FOUNDATION . CMU OR CONC. WALLS W/ STEEL ROOF JOISTS

MODIFY EXISTING RANGE: OUTDOOR, WALK DOWN, FIXED FIRING LANE RANGE TO BE MOSTLY REBUILT W/ CONC. OVERHEAD BALLISTIC BAFFLES ON STEEL COLUMNS. NEW 12" THICK REINFORCED CONC. BALLISTIC SIDE WALLS AND NEW CONC. SLAB SLOPED AT 1.5% TO DRAIN.

NEW STORAGE + GUN CLEANING AREA: NEW MEMBRANE ROOFING ON STEEL ROOF JOISTS ON NEW + EX. CMU + BRICK WALLS, SPACES CONDITIONED FOR DRY STORAGE. HEAVY DUTY STEEL DOORS AND WORK BENCH

NEW LEAD MGMT. AREA: NON TEMPERED OR CONDITIONED STORAGE SPACE. STEEL ROOF JOISTS ON NEW CONC. WALL + EX. CMU WALLS. NEW 3 PHASE SERVICE FOR NEW DUST COLLECTOR UNIT PER ELECTRICAL DRAWING

RANGE SPECIFIC EQUIPMENT: FOR DUST COLLECTOR, TOTAL CONTAINMENT BULLET TRAP, ACOUSTICAL TREATMENT AND TARGET SYSTEMS SEE CP1A

NEW BREEZEWAY: NEW METAL ROOF STRUCTURE OVER NEW CONC. STEPS

SITE IMPROVEMENTS: RESTORE SITE PAVING AND PARKING SURFACES AND VEGETATION AND TREE CANOPY TO SITE PLAN REQUIREMENTS SEE A 1.1

① NEW WORK PLAN

14,000 SF

EXISTING FOOTPRINT STUDY

15,177 SF

NEW FOOTPRINT STUDY

9,000 SF

EXISTING ROOF STUDY

10,376 SF

NEW ROOF STUDY*

EXISTING TRAP TO REMAIN (REDUCED BY 2 MODULES)

NEW LEAD MGMT. AREA BEYOND

TYP. NEW CONCRETE BALLISTIC BAFFLE*

TYP. LIGHT OR SPEAKER MOUNTING POSITION

NEW CLASSROOM BUILDING

② NEW WORK SECTION

PROPOSED

1 LEVEL

SCALE: 3/32" = 1'-0"

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CSX RAILROAD TRACKS

COVANTA WASTE TO ENERGY BUILDING

UPS PARKING LOT

COVANTA DRIVE

EX. PROPERTY LINE

SUBSTATION

EXISTING OUTDOOR FIRING RANGE

EX. CLASSRM./ OFFICE

FIRE STATION BUILDING 210
FF = 114.73 (OFFICE SIDE)
FF = 114.40 (BAYS)
BF = 100.73

LOT 700
(131,357 SQ. FT. OR 3.0155 AC.)

YARD HYDRANT

HOSE BIB

GAS METER

RELOCATED POWER POLE & CATV PEDESTAL

EISENHOWER AVENUE (80' ROW)
(ON-ROAD BIKE WAY)

LIMITS OF DISTURBANCE

SLIDING GATE

RPA LIMITS FIELD VERIFIED ON 01-2012

N

1 SITE PLAN
SCALE: 1" = 30'
0 30' 60'

EXISTING

SCALE: 1" = 30'-0"

CSX RAILROAD TRACKS

COVANTA WASTE TO ENERGY BUILDING

UPS PARKING LOT

EX. PROPERTY LINE

COVANTA DRIVE

SUBSTATION

NEW LEAD MNGMT. AREA

EXISTING OUTDOOR FIRING RANGE (MODIFIED)

NEW STORAGE AREA

NEW CLASSRM. OFFICE WING

EX. PARKING

FIRE STATION BUILDING 210
FF = 114.73 (OFFICE SIDE)
FF = 114.40 (BAYS)
BF = 100.73

LOT 700
(131,357 SQ. FT. OR 3.0155 AC.)

YARD HYDRANT

HOSE BIB

GAS METER

RPA LIMITS FIELD VERIFIED ON 01-2012

IMPOUND LOT

SLIDING GATE

LIMITS OF DISTURBANCE

RELOCATED POWER POLE & CATV PEDESTAL

EISENHOWER AVENUE (80' ROW)
(ON-ROAD BIKE WAY)

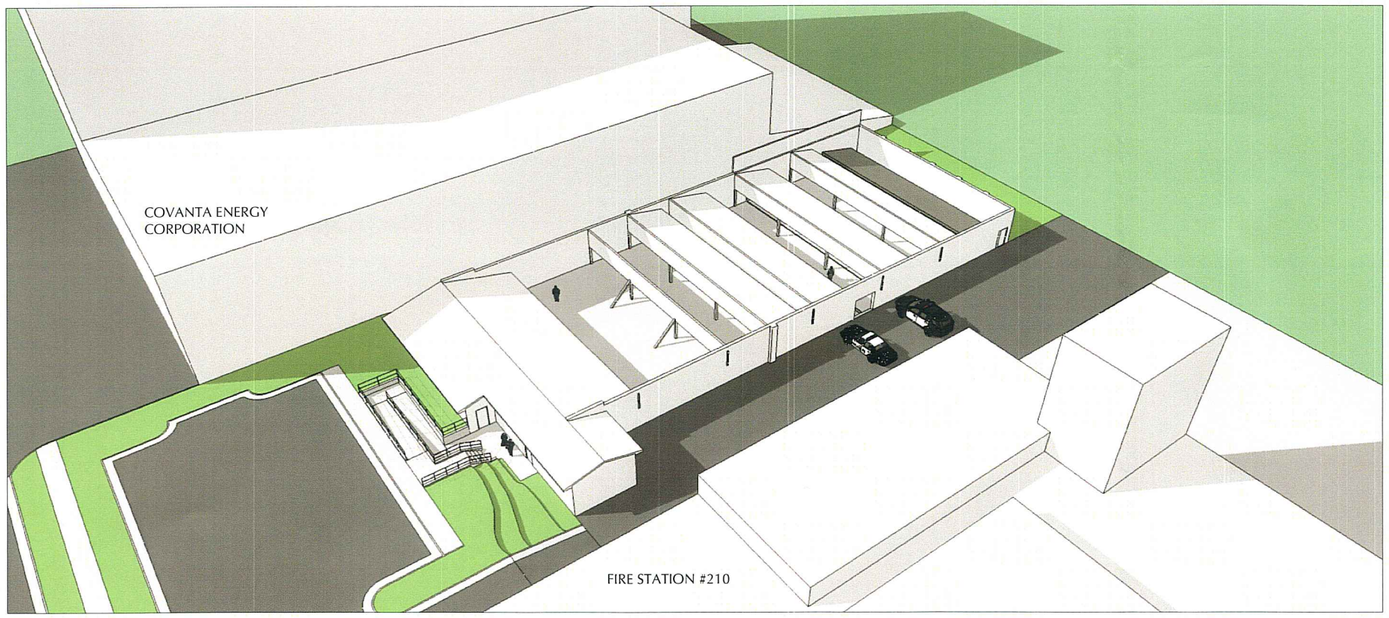
N
NGS 1900 NORTH

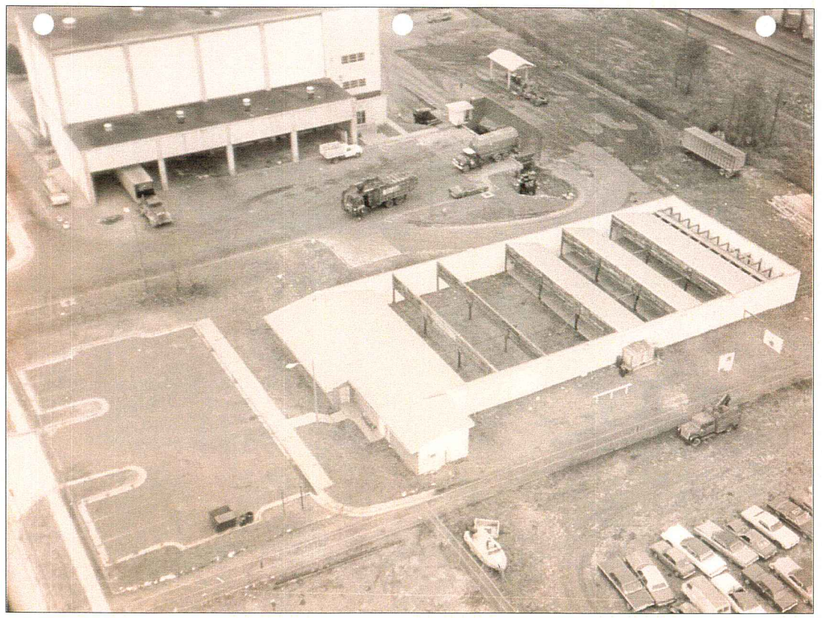
1 SITE PLAN
SCALE: 1" = 30'
0 30' 60'

PROPOSED

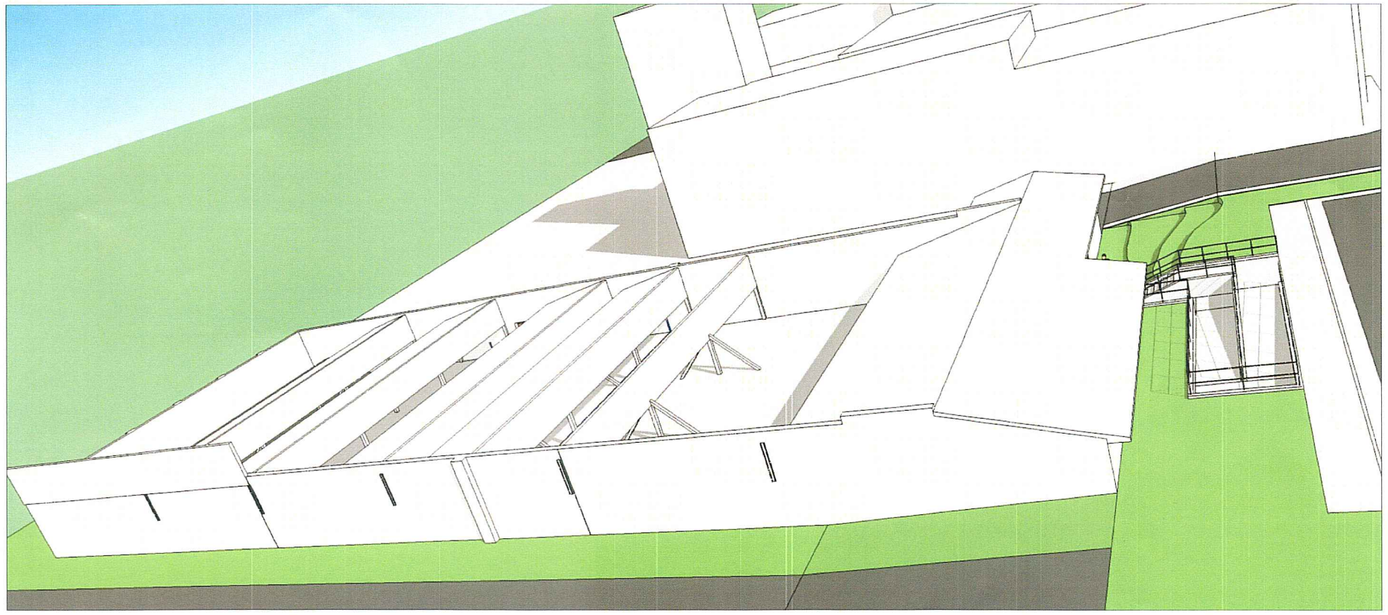
SCALE: 1" = 30'-0"

PROPOSED OVER EXISTING SITE + CONTEXT



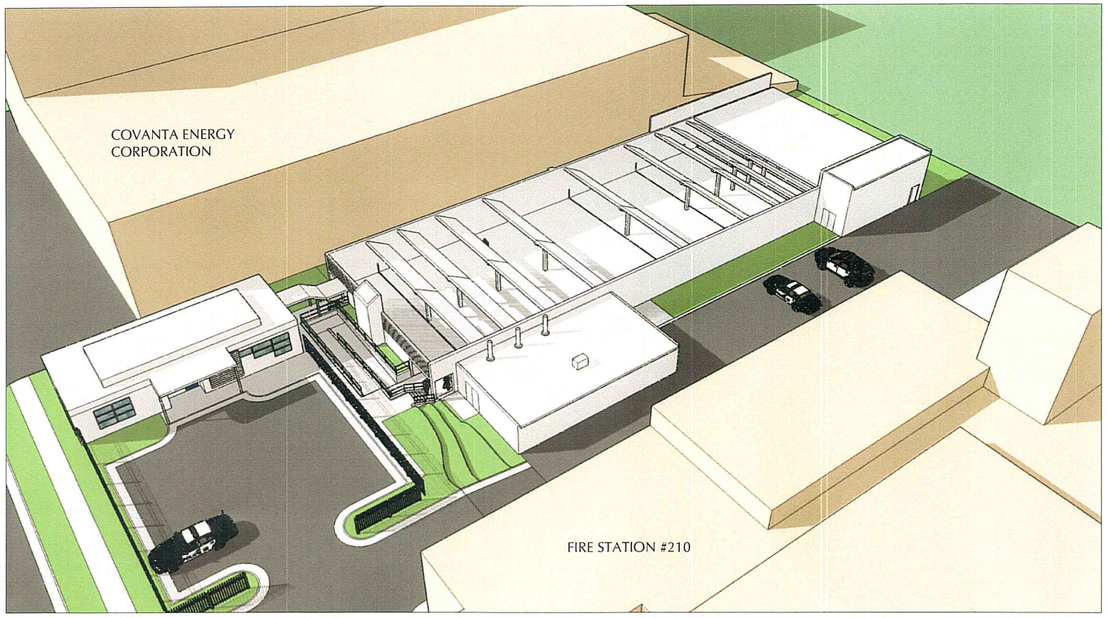


AERIAL VIEW: CURRENT + HISTORIC

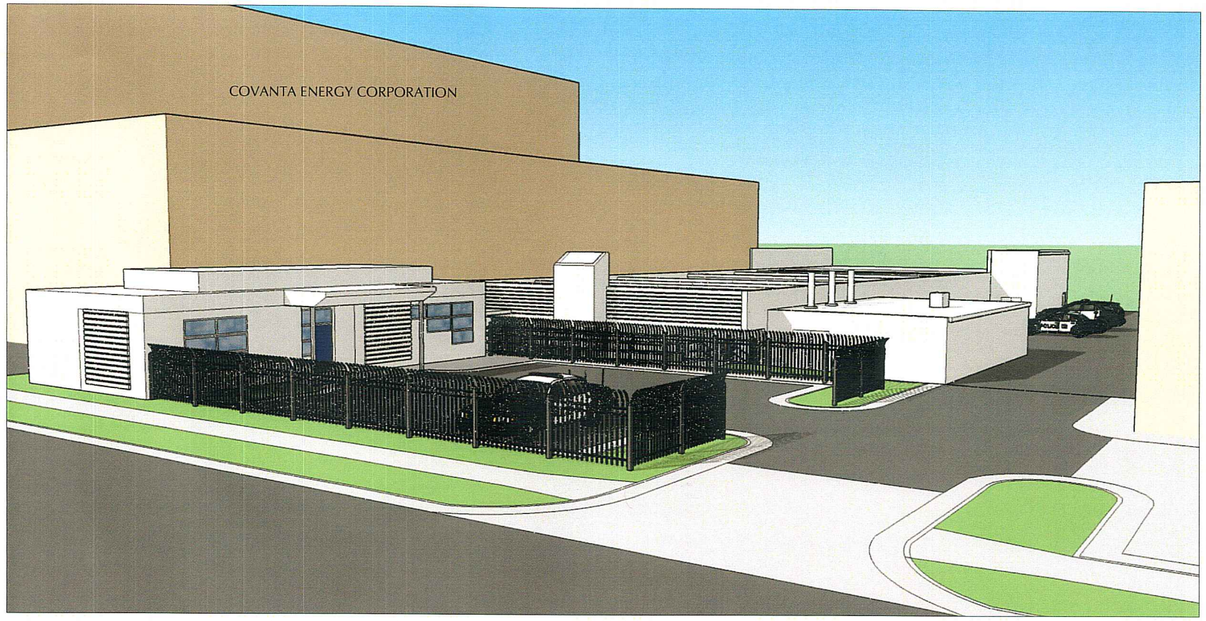


AERIAL VIEW: CURRENT + HISTORIC

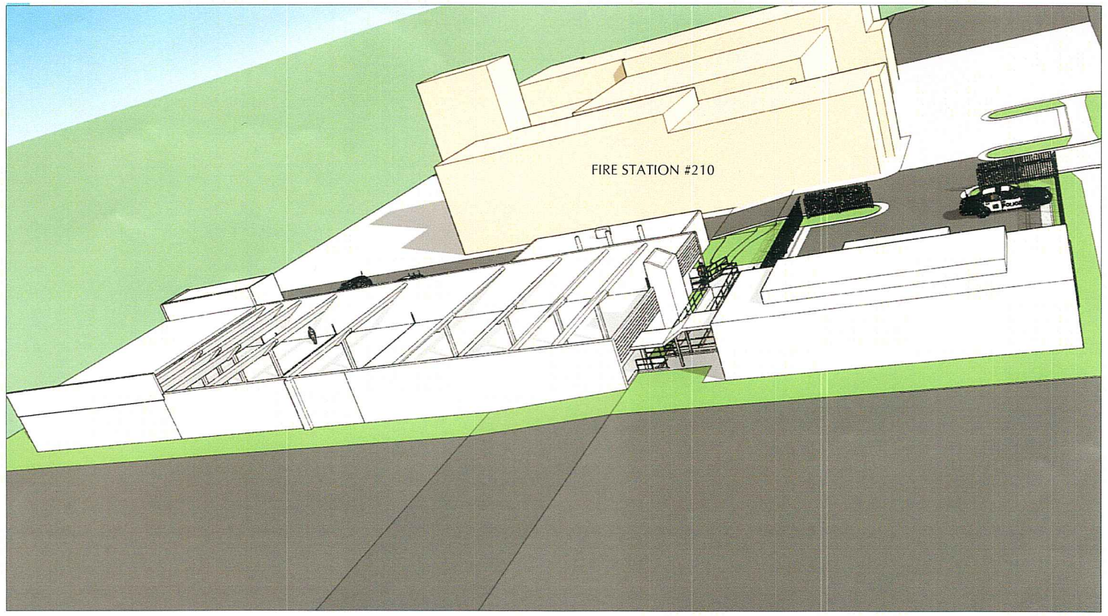
EXISTING



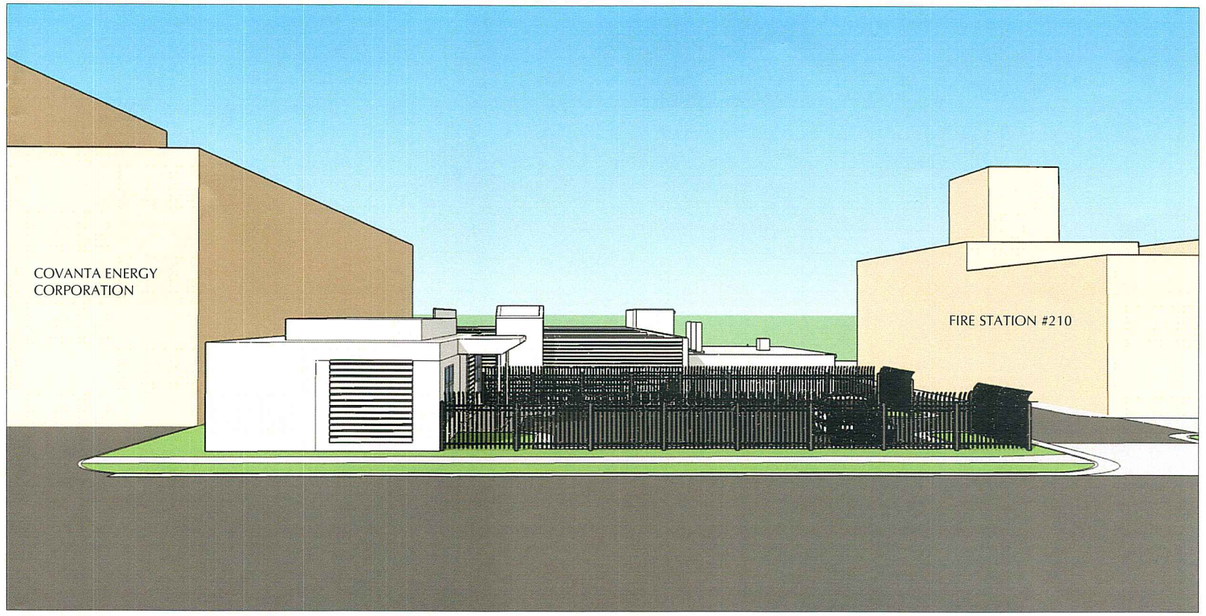
EASTERN AERIAL VIEW



VIEW FROM EISENHOWER AVE

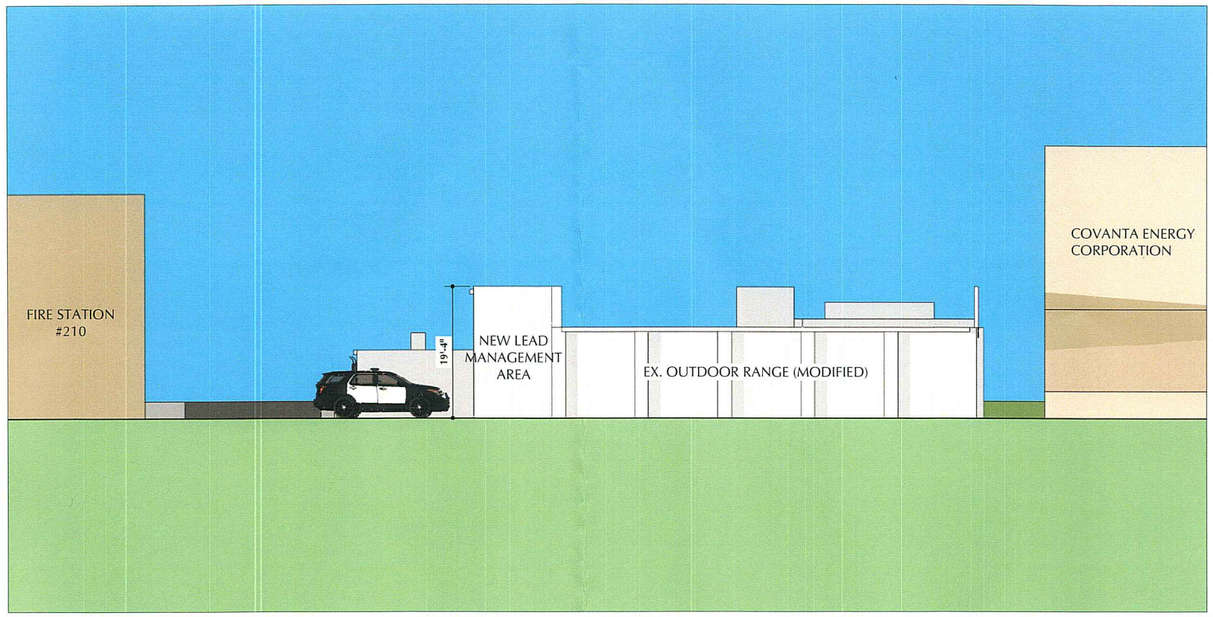


WESTERN AERIAL VIEW

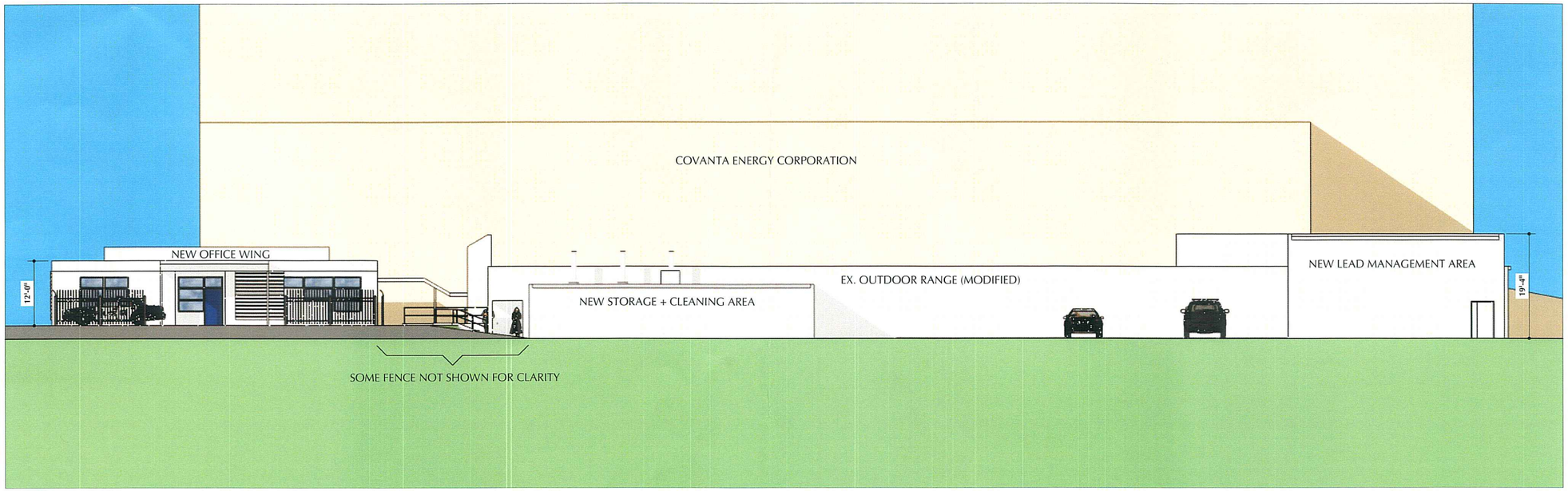


HEAD ON FROM EISENHOWER AVE

PROPOSED

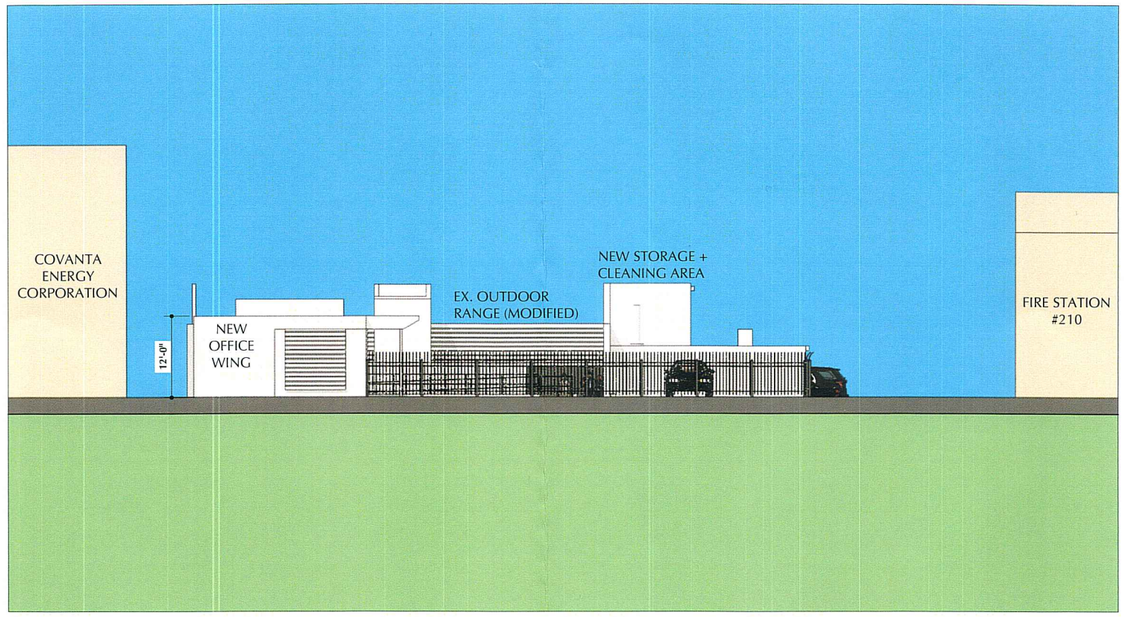


① **NORTH ELEVATION**
0 10' 20' SCALE: 3/32" = 1'-0"



② **EAST ELEVATION**
0 10' 20' SCALE: 3/32" = 1'-0"

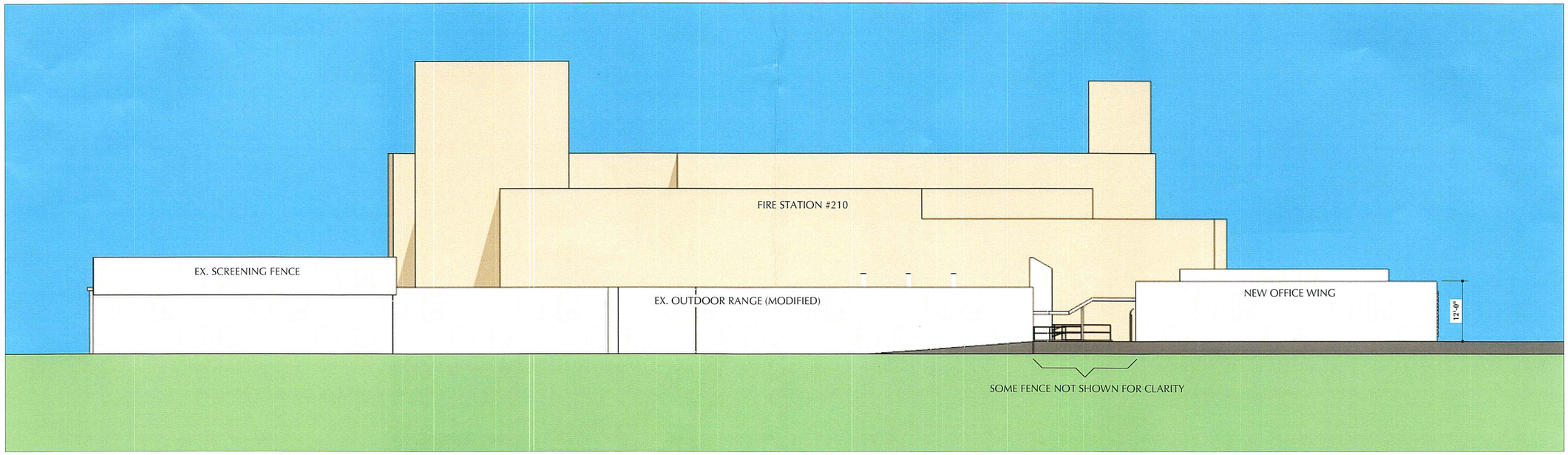
PROPOSED



① **SOUTH ELEVATION**

SCALE: 3/32" = 1'-0"

0 10' 20'



② **WEST ELEVATION**

SCALE: 3/32" = 1'-0"

0 10' 20'

PROPOSED

SM&W
AROUND THE WORLD - 20 YEARS

CHARLES HILL TRAINING FACILITY
ALEXANDRIA POLICE DEPARTMENT
FIRING RANGE

ALEXANDRIA, VIRGINIA

Initial Acoustical Report

SM&W # 08235

Prepared for:

Mr. George F. Delimba
Senior Project Manager
City of Alexandria
Department of General Services
110 North Royal Street, Suite 300
Alexandria, VA 22314

May 14, 2008

INTRODUCTION

The purpose of this report is to document and report existing noise conditions at the site, and preliminary acoustical recommendations for improvements to the Charles Hill Training Center located at Eisenhower Avenue in Alexandria, VA.

This report covers the results of our measurements at the site, recommendations for modifications for the facility to best limit noise transmission to the community and to best isolate the interior spaces from the noise of the firing range.

If you have any questions or would like to discuss the information contained in this report, please call Julie Fischer or Chris Pollock at 703-243-6301 or by email at jfischer@dc.smwinc.com or cpollock@smwinc.com.

MEASUREMENT EQUIPMENT

All sound level measurements were taken using calibrated sound level meters. These meters were:

- Brüel & Kjær 'Modular Precision Sound Analyzer Type 2260'
- Cel-500 Series Sound Analyzer – Model 593.C1t/2m

These are industry accepted sound level measurement devices and comply with requirements for Type 1 as per IEC standards 60651, 60804 and 225:1966. These meters allow simultaneous measurements of both third-octave band sound levels and statistically averaged dBA levels.

SITE TESTING & OBSERVATIONS

Noise Level Descriptors

When discussing time averaged noise levels there are a number of descriptors that are used. The following is a brief discussion of these statistical descriptions and their relevance to community/traffic noise and residences.

A weighting (dBA)

The human ear does not perceive all frequencies of sound equally. It is less sensitive at low and high frequencies than it is to medium frequencies. The biological reason for this is that voice sounds are typically in the middle frequencies, and the ears are primarily a communication tool. To obtain a single number representing the level of a sound containing a wide range of frequencies which is also representative of the ear's response, it is necessary to account for the effects of the low and high frequencies with respect to the medium frequencies. A measurement system that simulates the response of the human ear, the "A-weighted sound level" or "dB(A)", is commonly used in view of its widespread recognition and its close correlation with human judgment of loudness and annoyance.

Measurement Locations

To determine the impact of the Firing Range on the Community, a location at the south end of Ferdinand Day Drive was chosen as it represents, what we observed as, the closest residential location to the Firing Range.

We also made measurements at the North end of the Facilities' Property, nearest to the train tracks, to determine the noise levels at the property line. This location was approximately in line between the Facility and the measurement location at Ferdinand Day Drive.

In addition, in order to gauge the impact of the gun noise on locations inside the Facility, measurements were made in the Range, the Office, the Classroom, Control Booth and Workroom during normal firing operations.

Testing at these locations was carried out in the mornings of May 5th and 7th from the hours of 7:00 AM to 11:00 AM. (There was no Firing activity on May 6th due to a police situation.) The conditions of these measurements are described below:

- On May 5th the Range was used by approximately 10-20 officers, this was described to us as a typical, though slightly small, group. The guns used during this training exercise were Glock 40's and 12 guage Shotguns.

- On May 7th the Range was used by approximately 30 officers, this was described to us as a larger group and consequently there was more firing of the weapons. The guns used during this training exercise were Glock 40's.

In both cases the officers fired in groups of approximately 10 people.

Measurement Locations

Site Observations

Firing Range Noise

During the morning of training that was occurring, we noted that there would be groups of perhaps 10 shooters firing a few times, followed by a short break (we understand for reloading, review and instruction) then another short burst of shots in another group. The noise from the range (with these weapons) is heard as a series of "popping" sounds, that are not easily distinguishable as gunshots. The grouping of shots makes for a "clattering" sounds that the lay-person would not assume is gun firing, as it sounds more like an industrial process or equipment operation rather than a distinct grouping of gunshots.

Train Noise

There are both Freight and Passenger Trains passing the measurement location. The passing of a train completely masks over the noise from the firing range. Based on our time at the site, this would seem to be a more significant source of noise than what we had measured from the Range. The timing of train events, and the use of louder weapons may change this relationship however.

Industrial Noise

We noted that there was a significant amount of noise from the Asphalt plant that is to the West of the Ferdinand Day Drive measurement location. This source was dictating the ambient noise level (when no trains or Range activity was present). There was also some impact from the trucks driving into the Garbage Facility directly adjacent to the firing range. These trucks drive around the North side of the Range, and are audible at both our measurement locations.

In addition to this noise there was also a significant amount of noise originating from the construction site for the new office building on Eisenhower Avenue. This contributed significantly to the ambient noise levels, particularly in the lower frequencies.

MEASUREMENT RESULTS

Individual Events

The following table gives our measurement results in dBA.

Activity	Location						
	Ferdinand Day Drive	Range Property Line	Range (behind 45 line)	Office/ Workroom	Classroom	Control Booth	Workroom
None (Ambient)	53	63	--	--	--	--	--
Glock 40	58	90	110-115	80	75	75	80
Shotgun – 12 gge	60	--	--	--	--	--	--

Alexandria Noise Code Comparison

We understand that one of the goals of the renovation is to provide as much acoustical isolation as is practical within the scope of the modification. As the first step, the above measurements have been made, in order to gauge the existing conditions. We are unsure if the Alexandria City Noise Code applies to the Firing Range, and we understand that there may be no requirement or intention to bring the existing or future sound levels within the limits established by the Code.

The Alexandria Noise Code, Section 11-5-5 Table III shows that the Residential property line noise limit of 55 dBA. The above readings should be used as a guide – rather than a strict comparison to the code, since these are individual readings rather than longer averaged measurement. (Hourly or 24 hour averages would be used if compliance was to be truly gauged). The levels at Ferdinand Day Drive are only slightly above the 55 limit, and when averaged over a longer period, may drop slightly bringing them more in line with the 55 dBA limit.

ACOUSTICAL DESIGN OPTIONS

At our initial meetings we have had some discussion on the various areas where acoustical constructions, products and approaches may impact the construction approach and of course budget. We understand that there is a fixed budget that must be worked with, and we provide the initial design recommendations that follow understanding that these will be discussed and perhaps modified to best work with the intent and budget of the projects overall goals.

Range Acoustical Finishes

As we had discussed in our recent meeting, we feel that the best surface for acoustical treatment remains the side walls and the ceiling overhead. The walls of the space will be totally exposed to the weather, and as such may require a different product than the underside of the ballistic protection/ roofing elements where a product can be protected from the weather. We also discussed that the sidewalls of the space are hit reasonably infrequently, while the ceiling locations are hit regularly.

For these reasons, we recommend that the following products be considered:

For the side walls (the entire wall behind the 45 yard line, and all of the sidewalls from grade level to the top of the wall, all the way to the bullet trap) we recommend a 1.25" – 1.5" thick acoustical spray-on product similar to Pyrok "Acoustement 40". This is a cement based spray applied product that is porous and sets hard to become fully weather resistant. This is applied as a seamless monolithic product, so any damage that may occur due to bullet strikes will leave a mark that will need to be patched. We anticipate that a patching process every few years may be feasible to up-keep the appearance, and acoustical performance of the facility. (Please see attached or www.pyrokinc.com)

For the underside of the roof elements we understand that the lowest portion sustains the most damage and that there may be space on the rear (higher) portion of each element to provide acoustical treatment. In this area, bullet strikes will happen, and we understand that a replaceable or panelized system is desired to allow for damaged areas to be replaced once they are non-functional. Based on this understanding, the product we feel may be suitable is Tectum 'I Roof Deck' or 'Roof Tile' systems. These are available for different thickness and spans to allow for suitable coverage. (Please see attached http://www.tectum.com/tectumi.htm)

The alternative for this location (and possibly for the sidewalls as well) would be panelized high density acoustical fiberglass, which we anticipate would degrade faster, as it would be softer and more easily damaged. This option would be similar to Kinetics Noise Control 'S-4' acoustical panels. These are panels that are weather proofed, and easily replaceable.(See attached, or http://www.kineticsnoise.com/interiors/s4.html)

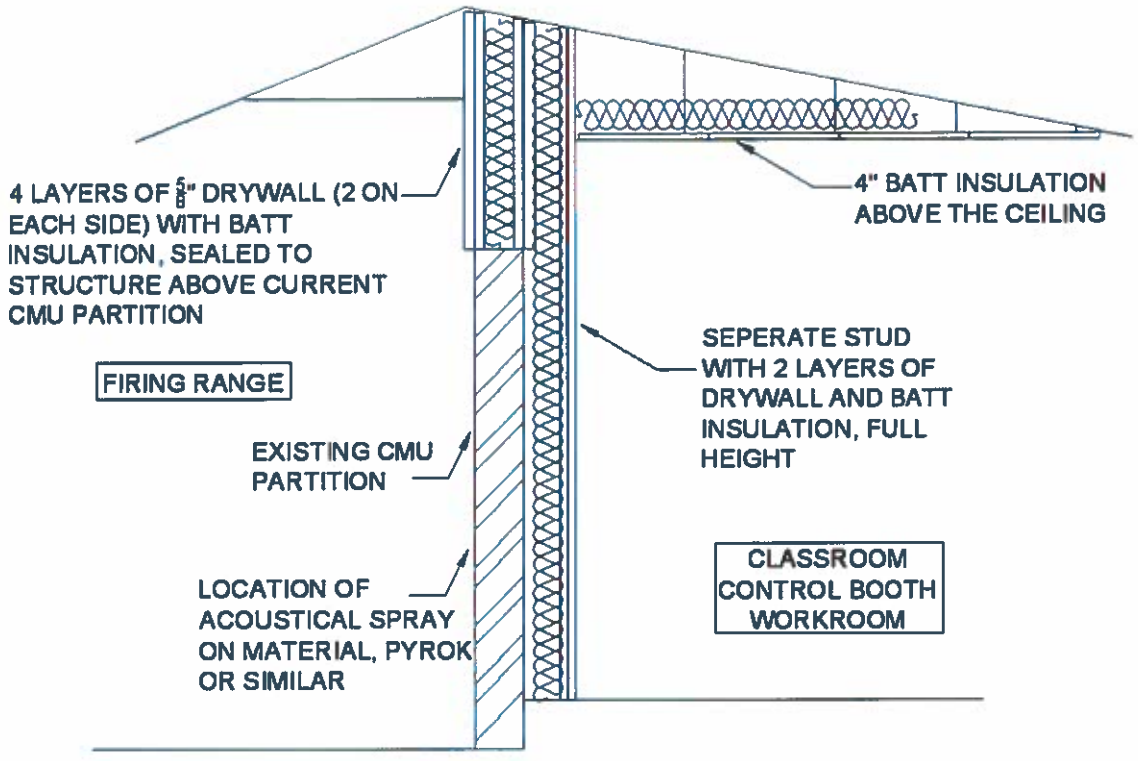
Office, Classroom and Control Booth/ Workroom Isolation

Walls

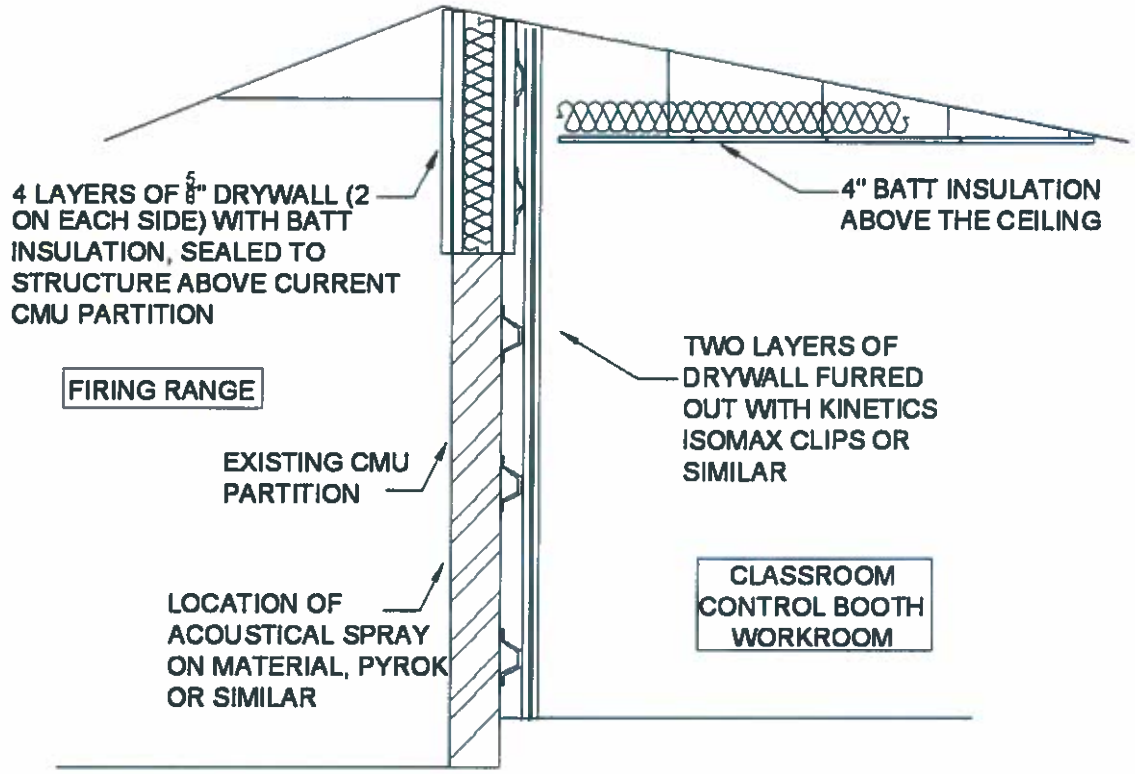
Due to the high noise levels that are to be controlled, we recommend that the walls of the Classroom, Office and Booth area all be upgraded. The first element would be to continue the acoustical wall (on top of the existing CMU wall) up to the roof structure. The second element could be one of two options:

> **Please note:** If a door is to be added to the office, prior to the fit-out of the rest of the project, we recommend that a small portion of these wall modifications be made at the office door frame, such that the office door and frame can be installed, and the recommended wall modification can be accommodated or continued for the remainder of the office at a later time.

1 – provide an independent metal stud on the interior side of the CMU wall and provide two layers of 5/8" gypsum board and full depth thick batt insulation in the stud cavity. This construction would be full height, from floor slab to the underside of the roof construction and fully sealed. On the CMU side of the independent stud, we recommend that a layer of noise barrier material be added, similar to Kinetics Noise Control 'KNM-100B' (see attached) (the stud is free standing away from the CMU) (Please below sketch for this option) or,



2 – Provide two layers of 5/8" thick gypsum board on resilient clips similar to Kinetics 'Isomax' (this construction is also full height from slab to roof construction). (Please below sketch for this option)



Ceiling

Because there is some possibility of sound transmission over the top of the CMU structure, we recommend that acoustical batt insulation (6" thick) be laid on top of the ceilings in the Classroom, Office and Control Booth areas.

Doors

Based on our recent discussion we understand that there is a desire to provide the best door that is practical. We recommend that the performance be specified as at least an STC 55 level. In addition to this overall acoustical rating, we would also recommend that more detailed requirements be added to the specification as follows:

1/3 Octave Sound Transmission Loss. (Lab tested per ASTM E90)

1/3 Octave Band Center Frequency (Hz)	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.50k	3.15k	4k	5k
Sound Transmission Loss (dB)	38	39	39	42	44	46	51	52	53	55	55	58	61	63	64	67	69	70

Windows

Given that the doors and the windows are the weak points in the construction, we recommend that they have the same level of acoustical performance. The control booth

window should therefore be rated for around STC 55 or higher. This window may also require ballistic resistance, with the same window vendors may be able to provide.

The following manufacturers all have products with different levels of acoustical performance with flexible surface finishes etc. All three vendors can provide Doors and Windows. Industrial Acoustics Company has a door system that is pre-hung and requires very little site installation to gain ideal acoustical conditions. The other vendors provide a 'kit' of parts which is then field assembled and the acoustical performance is dependant on the attention to detail provided in the field.

Industrial Acoustics Company
Tel. 1-718-931-8000
Web. http://www.industrialacoustics.com

Overly Manufacturing Company
Tel. 1-800-979-7300
Web. http://www.overly.com

Krieger Steel Products Company
Tel. 1-562-695-0645
Web. http://www.kriegersteel.com/index.htm

Mechanical Noise Control

Although controlling HVAC noise in this facility may seem insignificant, we suggest that the following guidelines be used when designing and selecting elements for the HVAC system – specifically for the Classroom where a relatively quiet sound level would be most desirable. By providing an acoustically lined duct run, based on distances and air velocities listed below, as well as proper selection of diffusers and dampers, the classroom space should be a suitable noise level.

Item / Location	Mechanical Acoustical Design Guidelines for Acoustically Sensitive (NC 30) Spaces
Diffusers, Grilles & Registers	NC 25 selection with no damper in diffuser necks or at plenum connections. Perforated diffusers (if appl.) NC 20 selection.
Air velocity at 5 feet from diffuser	400±fpm (as required to meet diffuser rating of NC 25 and diffuser mechanical performance). Velocities to be lower if no acoustical lining is to be used.
Flexible ductwork	Flexible duct to be minimized (Flexmaster 8M or eq.).
Volume dampers	Damper within each branch to diffusers, and minimum 3 feet from diffusers and grilles.
Air velocity at 10 feet from diffusers	800±fpm
Maximum low pressure duct air velocity	1000±fpm
Note: Velocities to be 20±% lower if no acoustical lining is to be used.	
Pressure Reducing Box and/or Fan Unit Location & Duct Layout	Box and/or fan located outside projected area of sensitive space with minimum 8 feet of ductwork and one horizontal elbow before entering projected area
Distance from box and/or fan to first diffuser	10 feet minimum
Box and/or Fan Discharge Noise Control	All low pressure duct and linear diffuser plenums with 1 inch acoustical lining.
Return Transfer through full height partitions	Acoustically line transfer duct open at top on each side of the partition and minimum 3 feet between openings. Ideally positioned above the door. Sized for pressure drop concerns

END OF REPORT

Please call if you have any questions or comments.

Kind regards,
Shen Milsom & Wilke, Inc.

Chris Pollock
Senior Associate

SAMPLE PERFORMANCE SPECIFICATIONS
SECTION 09210

SPRAY-APPLIED ACOUSTICAL CEMENT PLASTER

ACOUSTEMENT 40

PART I: GENERAL

1.01 WORK INCLUDED

A. Extent of sprayed-on decorative/acoustical insulation is indicated on drawings.

1.02 QUALITY ASSURANCE

A. Provide Portland cement-vermiculite material which has been tested to and achieved the following values:

TEST METHOD/ AUTHORITY	PROPERTY	VALUE
ASTM E605	Density	41 Lbs./Cu.Ft.
ASTM E761	Compressive Strength	300 psi.
ASTM E736-86	Bond Strength	5000 Lbs./Sq Ft
ASTM E84-87	Surface Burning Characteristics	0 Flame Spread 0 Smoke Developed
ASTM C423-84A	Sound Absorption	0.60 NRC @ 1" Thick 0.50 NRC @ .5" Thick
University of Pittsburgh Toxicity Test	Toxicity	LC_{50} > 300 Grams
ASTM E136	Combustibility	Non-Combustible
ASTM D2240	Hardness	70

B. Provide testing results and procedures which have been certified by Cedar Knolls Acoustical Labs or other accredited independent testing laboratories. Peak thickness of test samples must be determined and reported by acoustical laboratory. Nominal thicknesses are not acceptable unless peak thicknesses are also reported.

1. NRC not less than 0.60 at 1 inch thickness and coefficient not less than 0.35, (+ or - 0.01), at 250 Hz. Conduct testing on solid backing with no air gap.

C. Installer: licensed by manufacturer.

D. Control Sample: Prior to installation of final coat, apply an area of 50 sq. ft. in presence of architect, for approval of finish texture, as selected from samples.

1.03 SUBMITTALS

A. Submit manufacturer's installation instructions, test data substantiating compliance with quality assurance.

B. Submit 12 inch square sample of sprayed-on acoustical material showing texture variations for approval. Resubmit as required until approved. All samples must be certified by manufacturer that they are representative of the texture which was acoustically tested in supporting acoustical test reports.

C. Submit test reports from all suppliers showing material to be 100% free of asbestos, mineral fiber, polystyrene and cellulose.

D. Submit certification of applicator licensing.

E. Submit acoustical sample for specified finish.

1.04 MATERIAL HANDLING

A. Keep material dry until ready for use.

1.05 WARRANTY

A. Manufacturer shall warrant the material to be supplied, agreeing to repair/replace that which has cracked, flaked, dusted excessively, peeled or fallen from substrate, or otherwise deteriorated to a condition where it would not perform effectively as intended for a sound absorbent purpose; due to defective materials and not due to abuse, improper maintenance, unforeseeable ambient exposures, or other causes beyond anticipated conditions by manufacturer. The warranty period will be 10 years from date of substantial completion.

PART II: PRODUCTS

2.01 MATERIALS

A. Materials shall be **Acoustement 40** manufactured by **Pyrok, Inc.**, Mamaroneck, N.Y.(914) 777-7070, info@pyrokinc.com, or equal.

B. Color shall be _____ or selected by the architect or engineer.

C. Texture shall be (Standard Texture) or (Semi-Smooth troweled finish).

D. Thickness shall be ___".

PART III: EXECUTION

3.01 INSPECTION AND PREPARATION

A. Examine all substrates and conditions.

B. Assure substrate is free of oil, grease, dirt, paint, or other matter which would impair bond or install metal lath as recommended by the manufacturer.

C. Do not proceed until said substrate and conditions are acceptable.

D. Prepare substrate by filling voids and cracks and offsets, remove projections that result in telegraphing presence of imperfections.

E. Prime substrate with primer or bonding agent as recommended by the manufacturer.

F. Do not apply insulation material when temperature is below 40 degrees F (ambient), or substrate is below 40 degrees F.

G. Mask all adjoining surfaces in order to minimize damage from overspray.

H. Provide ventilation if required, and avoid excess drying rates.

I. Provide tarps or temporary enclosures as necessary to confine operations.

J. Perform all patching and repairing of insulation required to be done due to cutting, etc., by other trades.

3.02 APPLICATION

A. Apply in accordance with manufacturer's instructions (except no spray pass shall exceed 1/4" thickness) using any rotary-stator plastering pump or other spray equipment approved by the manufacturer.

B. Install to thickness indicated or thickness required to achieve NRC specified.

C. Ensure that texture and color are all as per control sample.

3.03 CLEANING AND PATCHING

A. Remove overspray and fall out material immediately upon completion of the work in each area. Clean surfaces to remove evidence of soiling. Repair or replace damaged work surfaces to acceptable conditions.

B. Coordinate work with other work, to minimize possibility of damage to insulation resulting from performance of subsequent work. As other units of work are completed in each area, patch damaged areas or surfaces of insulation by over spraying to match original installations, or by patching procedures as required to provide acceptable results.

TECTUM Roof Deck Systems

With various edge treatments, Tectum panels are used as the substrate for all Tectum roof deck systems. Tectum roof plank panels have T&G long edges and square ends. Plank is designed to span structural supports. Tectum roof tile systems have rabbeted long edges and either square or T&G ends. Tiles span between structural tees. Tees span between supports.

LIMITATIONS - TECTUM I, III, E, NS

When designing for high-humidity applications such as pools or ice arenas, please contact the Tectum Inc. technical department for assistance.

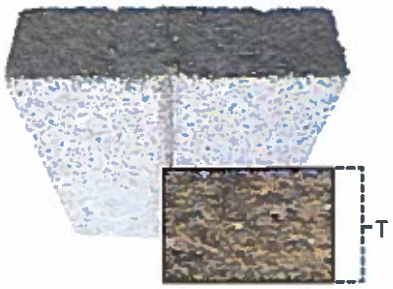
COMBUSTIBILITY

Warning: All foam insulation should be adequately protected. Styrofoam brand and EPS insulation are combustible and may constitute fire hazards if improperly used or installed. Use only as directed by the specific instructions for these products. Styrofoam brand and EPS insulation contain a flame retardant additive to inhibit accidental ignition from small fire sources. During shipping, storage, installation and use, this material should not be exposed to flame or other ignition sources.

TECTUM I

Tectum I is typically used in low slope applications and provides a thermal barrier for field-applied foam plastics. It is compatible with virtually all roof installation materials. Underside exposed joints have attractive beveled edges. LS (long span) panels available with steel channel reinforcement.

The Tectum I roof deck system consists of standard TECTUM panels in either plank or tile configurations.

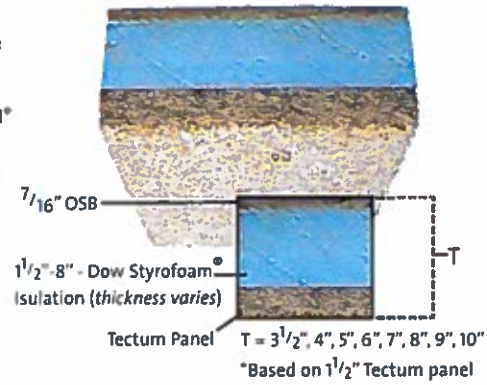


T = 2", 2 1/2", 3"

TECTUM III

The Tectum III roof deck panel is a composite of a 1 ½" or thicker Tectum substrate, Dow Styrofoam® brand XPS (extruded polystyrene) insulation 1 ½" to 8" thick and 7/16" OSB (oriented strand board) sheathing with a slip-resistant surface. Components are bonded with code-listed structural adhesives.

Tectum III panels are typically used in sloped applications where insulation and a nailable surface are required.



TECTUM INC
The Noise Control Solution

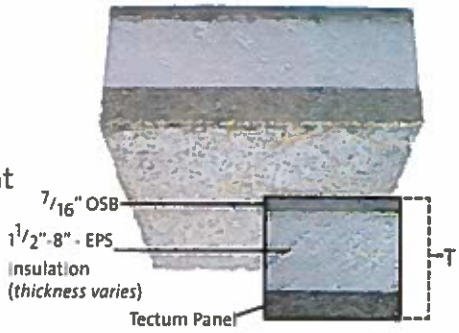
Tectum panels are composed of aspen wood fiber (excelsior) bonded with an exclusive inorganic hydraulic cement and are formed by a continuous process under heat and pressure. Tectum panels combine several materials to create a decorative product that provides excellent sound absorption, abuse resistance, insulation and a textured interior finish. A silicone treatment to the panel resists water and water migration. There are no urea formaldehydes or CFCs in any Tectum product.

NOTE: There is no asbestos, nor has there ever been any asbestos, used in Tectum products.

TECTUM E

The Tectum E roof deck panel is a composite of a 1½" or thicker Tectum substrate, EPS (expanded polystyrene) insulation and 7/16" OSB sheathing with a slip-resistant surface. Components are bonded with code-listed structural adhesives.

The EPS core exceeds the requirements of ASTM C-578 Type I and bears the UL classification mark.

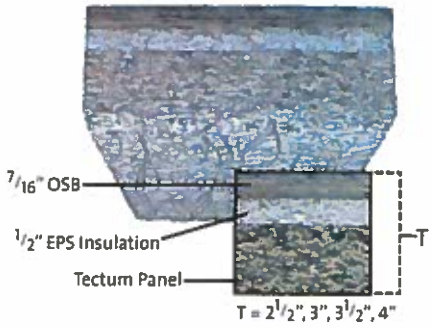


T = 3½", 4", 5", 6", 7", 8", 9", 10"
*Based on 1½" Tectum panel

TECTUM NS

The Tectum NS (nailable surface) roof deck panel is a composite of a 1½" or thicker Tectum substrate, ½" thick EPS (expanded polystyrene) insulation and 7/16" OSB sheathing with a slip-resistant surface. Components are bonded with code-listed structural adhesives.

Tectum NS Panels are typically used in sloped applications where minimal insulation is required, such as outdoor pavilions.



T = 2½", 3", 3½", 4"

DIAPHRAGM DESIGN DATA

TECTUM ROOF DECK FASTENER SPACING SCHEDULE

Type	Panel Size	Test No.	Joist	Span[4]	Fasteners	Field Spacing[2]	Perimeter	Adhesive[1,3]	Grout	ULT/LF	DSN/LF
T-I Plank	3"x31"x96"	88-3113-1	Steel	48"	S-25/2" Washer	3/Joist/Panel	16" o.c.	No	None	825	275
T-I Plank	3"x31"x96"	88-3113-1	Steel	48"	S-25/2" Washer	3/Joist/Panel	16" o.c.	T&G+Joist	None	1350	450
T-I LS	2 ½"x31"x120"	94-30037D	Wood	60"	3 ½" 14 Gauge Scr/2"w	2/Joist/Panel	10" o.c. sides + ends	T&G+Joist	None	1170	389
T-I LS	3"x31"x144"	94-30037D	Wood	72"	4 ½" 14 Gauge Scr/2"w	2/Joist/Panel	12" o.c. sides + ends	T&G+Joist	None	860	286
T-I LS	2"x31"x96"	94-30270	Wood	48"	3 ¼" 14 Gauge Scr/2"w	2/Joist/Panel	12" o.c. sides + ends	T&G+Joist	None	964	321
T-I LS[5]	3"x 31"x144"	02-030070B	Wood	72"	4 ½" 14 Gauge Scr/2"w	2/Joist/Panel	12" o.c. sides + ends	T&G+Joist	None	1631	542
T-I Tile	2"x23 ½"x143"	88-3113-1	Steel	72"	112 Ts/112 x Ts	24" o.c.	112 Ts	No	4 Sides	925	313
T-I Tile	2"x31 ½"x95"	88-3113-1	Steel	96"	168 Ts/112 x Ts	32" o.c.	168 Ts	No	4 Sides	575	200
T-I RT/TG	2"x31 ½"x96"	91-3222	Steel	96"	000-5-14-2+S-25/2"w	32"o.c.+2/Joist	S-25@16"+3/End	T&G+Per	Long Edge	696	231
T-I Tile	2"x31 ½"x96"	94-30037H	Steel	96"	000-5-14-2+S-25/2"w	2/Joist	10 ½" o.c.	Joist	Long Edge	835	278
T-I Tile[5]	2"x31 ½"x96"	02-030070A	Steel	96"	218 Ts/3 ¼" 14 Gauge/2"w	2/Joist/Panel	12" o.c. sides + ends	Joist	Long Edge	1530	509
T-III Plank	3 ½"x47"x144"	94-30037A	Wood	72"	6" 14 Gauge Sip Scr	3/Joist/Panel	12" o.c. sides + ends	T&G+Joist	None	1068	355
T-III Plank	3 ½"x47"x120"	94-30037B	Wood	60"	6" 14 Gauge Sip Scr	3/Joist/Panel	12" o.c. sides + ends	T&G+Joist	None	1093	363
T-III Plank	5"x47"x144"	94-30037E	Wood	72"	6" 14 Gauge Sip Scr	3/Joist/Panel	12" o.c. sides + ends	T&G+Joist	None	964	320
T-III Tile	3 ½"x47 ½"x96"	95-30060	Steel	96"	000-3-14-3 ½"+14GA/1 ½"w	3/Joist/Panel	12" o.c. sides + ends	Joist	Long Edge	939	312
T-E Plank	4"x47"x144"	94-30037C	Wood	72"	6" 14 Gauge Sip Scr	3/Joist/Panel	12" o.c. sides + ends	T&G+Joist	None	1042	346
T-E Plank	5"x47"x168"	98030199	Wood	84"	6" 14 Gauge Sip Scr	3/Joist/Panel	12" o.c. sides + ends	T&G+Joist	None	1012	336
T-E Plank	5"x48"x96"	94030321	Wood	96"	6" 14 Gauge Sip Scr	4/Joist/Panel	12" o.c. sides + ends	T&G+Joist	None	604	201
T-III Plank/ Overlay	5"x47"x144" / 7/16"x48"x144"	92-3777	Wood / OSB	72" / —	6" 14 Gauge Scr/1 ½"w / 2"x16 Gauge Staples	6/Joist/Panel / 8"@24" Centers	6" o.c. sides + ends / 4" o.c. sides + ends	T&G+Joist / Per&24"o.c.	None / None	2363	786
T-E Plank/ Overlay	5"x47"x96" / 7/16"x48"x96"	98030262	Wood / OSB	96" / —	6" 14 Gauge Sip Scr / 2"x16 Gauge Staples	4/Joist/Panel / 8"@24" Centers	8" o.c. sides + ends / 4" o.c. sides + ends	T&G+Joist / Per&24"o.c.	None / None	1315	437

NOTES:
1. Adhesive is to meet the requirements of AFG-01. A 3/8" bead of adhesive is to be used. Approximately 50 lin. ft. of adhesive per quart tube.
2. All panels were installed with staggered ends except Tectum I tile with 168 bulb tees and Tectum III tile on truss tees.
3. Specific adhesive used on test assemblies was Miracle Construction adhesive SFA-66.
4. Values over wood joists are conservative when supports are steel.
5. Visit our Web site to download technical bulletin T-77 for more information. Call for assistance when designing and detailing this Tectum roof deck system.

TECTUM INC
The Noise Control Solution

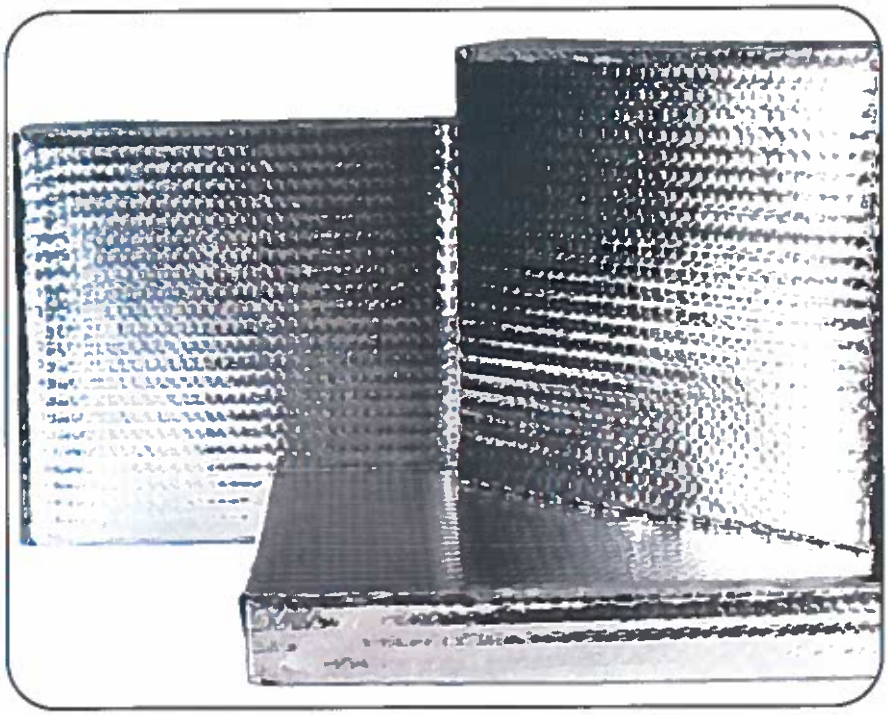
P.O. Box 3002
Newark, OH 43058

105 S. 6th St.
Newark, OH 43055

Pub. #T105

KINETICS NOISE CONTROL

S-4 Absorption Panel



This fully encapsulated sound absorber can be cleaned with steam or a soap solution and is very economical. The durable fiber reinforced face is available in white or reflective silver.

The Kinetics Model S-4 panel is an economical and easily cleanable sound absorber. The panel is constructed from a 3 PCF fiberglass core completely encapsulated with a 1.5 mil thick fiberglass reinforced, aluminized polyester film facing. This product is available in 1" and 2" thicknesses and panel sizes up to 48" x 96".

This product is well suited for projects where moisture resistant sound absorber panels are required. Applications include natatoriums, shooting ranges, dog kennels, arenas, and mechanical rooms. The S-4 panel with aluminized (silver) facing can be used in temperatures from -40° F to 450° F. The surface material is light reflective and flame resistant (see reverse for details). This product can be steam cleaned.

KINETICS Noise Control

6300 Irelan Place
Dublin, OH 43017
1.800.959.1229 Toll-Free
www.kineticsnoise.com

Over 40 years of success solving acoustic and noise control problems!

TECHNICAL INFORMATION

Description

A fully encapsulated moisture resistant fiberglass sound absorber.

Composition

1" or 2" thick 3 PCF fiberglass core
Completely wrapped with a 1.5 mil thick neoprene-coated, fiberglass reinforced, aluminized polyester reflective film facing. Select reflective silver (fire rated) or white.

Acoustical Performance

Sound Absorption per ASTMC 423-66

Frequency, Hz	125	250	500	1000	2000	4000	NRC
1" Thick	.13	.32	.95	1.08	.62	.46	**.75**
2" Thick	.26	.80	1.23	1.00	.71	.43	**.95**

Fire Test Data*

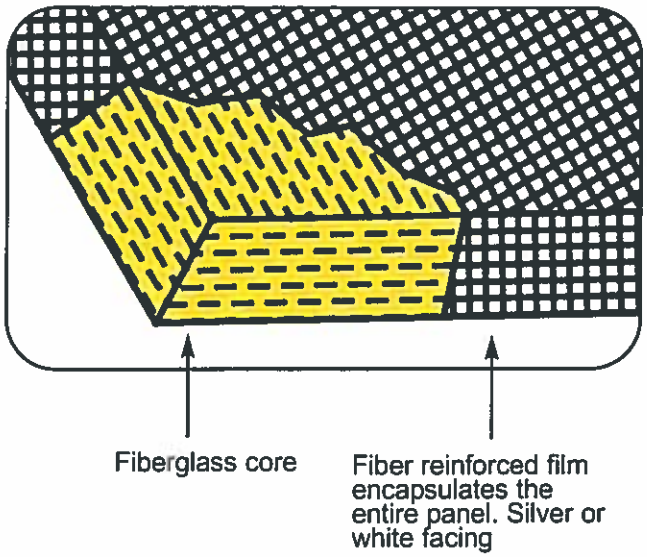
Class 1 per UL 723 at independent laboratory
Flame Spread - 15 or less
Smoke developed rating - 10 or less
Fuel Contribution - 0
*Silver, aluminized facing only

Applications

Projects that require a highly cleanable, and moisture resistant acoustical treatment that is economical.
Arenas
Natatoriums
Dog Kennels
Shooting Ranges
Mechanical Equipment Rooms
Workshops

Mounting

S-4 Clips
J-Clips (top and bottom)
Adhesive



Download the Specification in CSI Masterformat at **www.kineticsnoise.com**

KINETICS Noise Control

Please contact your factory representative for design layout, specifications and pricing

04/07

KINETICS™
Barrier Materials
Model KNM

NEW - scuff resistant reinforced barrier

Description
Kinetics Model KNM Loaded Vinyl Limp Mass Barrier Materials are used for enclosing noise sources, either draped around equipment, suspended between equipment and quiet areas, or lagged to the equipment casing. KNM Barrier Materials can be used effectively to lag piping systems, reducing valves, etc., and are highly effective as crosstalk barriers and septums. KNM materials are available in 1/2 psf to 1 psf (2.5 to 4.9 kg/m²) surface weight, in 54" wide x 20 yard (1372 mm x 18.2 m) rolls, with acoustical ratings of STC-21 to STC-27.

Kinetics Model KNM-C Clearview Noise barriers are transparent, limp heavy PVC and are recommended for use in applications where it is necessary to maintain visual contact with noisy equipment, yet achieve a high degree of noise reduction. KNM-C materials are available in 48" wide by 20 yard (1219 mm x 18.2 m) rolls with acoustical ratings of STC-21 and STC-27.

Application
Pipe and duct noise lagging
Machinery covers
Ceiling noise barriers
Crosstalk barrier
Wall and door septums
Noise curtain panels and enclosures
Rooftop equipment barriers
OEM applications

Product Description

KNM-50C 1/2 PSF (2.5 kg/m²) Kinetics Clearview barrier material, nonloaded and nonreinforced. Clearview is very limp, tough and water clear. Available in 48" x 20 yard (1219 mm x 18.2 m) rolls.

KNM-100C 1 PSF (4.9 kg/m²) Kinetics Clearview barrier material, nonloaded and nonreinforced. Clearview is very limp, tough and water clear. Available in 48" x 20 yard (1219 mm x 18.2 m) rolls.

KNM-50B 1/2 PSF (2.5 kg/m²) Kinetics limp barrier material, unreinforced and loaded with barium sulphate. Available in black color in 54" x 20 yard (1372 mm x 18.2 m) rolls.

KNM-100B 1 PSF (4.9 kg/m²) Kinetics limp barrier material, unreinforced and loaded with barium sulphate. Available in black color in 54" x 20 yard (1372 mm x 18.2 m) rolls.

KNM-50RB 1/2 PSF (2.5 kg/m²) Kinetics limp scuff resistant barrier material, reinforced with a fiber glass screen, and loaded with barium sulphate. Available in gray color in 54" x 20 yard (1372 mm x 18.2 m) rolls.

KNM-100RB 1 PSF (4.9 kg/m²) Kinetics limp scuff resistant barrier material, reinforced with a fiber glass screen, and loaded with barium sulphate. Available in gray color in 54" x 20 yard (1372 mm x 18.2 m) rolls.

Specifications

Barrier material shall meet the sound transmission loss and physical properties performance and the flammability standards listed in this brochure.

Barrier material shall have a minimum continuous operating temperature range from -40° to + 180°F (-40° to 82.2°C), be resistant to water, oils weak acids, alkalies, and fungi, and have excellent weather resistance.

Barrier material to be Model KNM by Kinetics Noise Control, Inc.

Physical Properties

Product	KNM-50C	KNM-50B	KNM-50RB
Wt. Lbs./Sq. Ft. (kg/m²)	0.50 (2.5)	0.50 (2.5)	0.50 (2.5)
Approx. Thickness (inches)	0.07"	0.05"	0.06"
Tensile Strength Lbs./In. (kg/mm)	201 (3.6)	55 (1.0)	300 (5.3)
Tear Strength, Lbs./In. (kg/mm)	70 (1.2)	10 (0.2)	100 (1.8)
Flammability			
Flameout, Sec.	3	3	3
Afterglow, Sec.	0	0	0
Char Length, In. (mm)	0.5 (13)	1.7 (43)	0.2 (5)

Product	KNM-100C	KNM-100B	KNM-100RB
Wt. Lbs./Sq. Ft. (kg/m²)	1.00 (4.9)	1.00 (4.9)	1.00 (4.9)
Approx. Thickness (inches)	0.15"	0.10"	0.10"
Tensile Strength Lbs./In. (kg/mm)	400 (7.1)	105 (1.9)	300 (5.3)
Tear Strength, Lbs./In. (kg/mm)	140 (2.5)	20 (0.4)	100 (1.8)
Flammability			
Flameout, Sec.	3	0	0
Afterglow, Sec.	0	0	0
Char Length, In. (mm)	0.5 (1.3)	0.2 (5)	0.2 (5)

Sound Transmission Loss, dB

Product	Weight Sq. Ft. (cm²)	125	250	500	1000	2000	4000	STC
KNM-50C	0.50 (464)	11	12	15	20	26	32	21
KNM-50B	0.50 (464)	11	12	15	20	26	32	21
KNM-50RB	0.50 (464)	11	12	15	20	26	32	21
KNM-100C	1.00 (929)	15	19	21	28	33	37	27
KNM-100B	1.00 (929)	15	19	21	28	33	37	27
KNM-100RB	1.00 (929)	15	19	21	28	33	37	27

KNM-9/98

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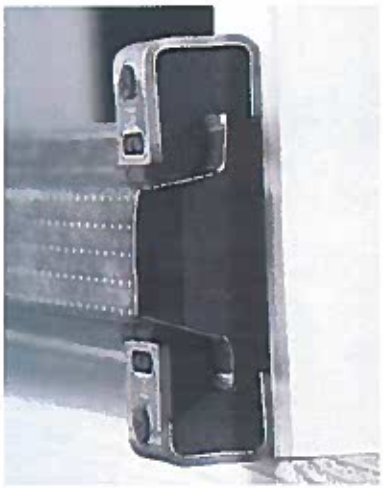
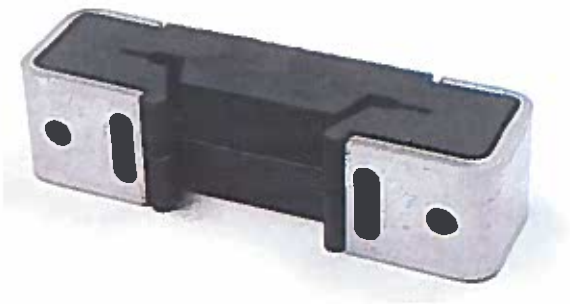
Resilient Sound Isolation Wall and Ceiling Clip

Model IsoMax





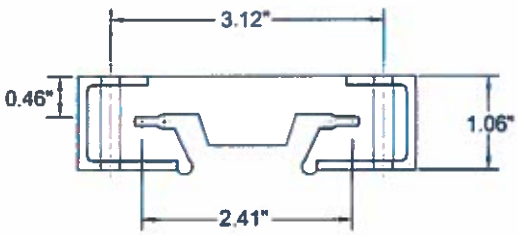
Wall and Ceiling Sound Isolation Theory:

Isolated wall and ceiling systems remain a popular method for mitigating noise problems. Resiliently mounted gypsum board or double wall assemblies are constructed to minimize sound transmission from one occupied space into another. Incorporating Kinetics Noise Control Model IsoMax, designers can create simple, easy to build walls and ceilings that do not require resilient channel, double-wall construction, and/or additional layers of gypsum board. Increasing the air cavity and resiliently decoupling the mass of the gypsum board from the non-isolated structure (e.g., joists, studs, masonry) effectively and economically controls noise transmission.

Application:

Designers wanting low-cost, space saving ceilings and walls that provide superior noise control can employ Kinetics Model IsoMax resilient sound isolation clip. Model IsoMax, attached to ceiling joists, wall studs, or masonry, simply and easily secures drywall furring channel. One or more layers of gypsum board are hung onto the furring channel using common construction practices. Offering higher STC values than drywall attached to resilient channel, Model IsoMax also ensures that installers will not inadvertently screw through the "resilient" leg of the channel into the joist or stud. Given the frequent occurrences where resilient channel is accidentally rendered ineffective because it is hard-attached, this feature cannot be underestimated when designing and constructing ceilings and walls for noise control.

Plan View



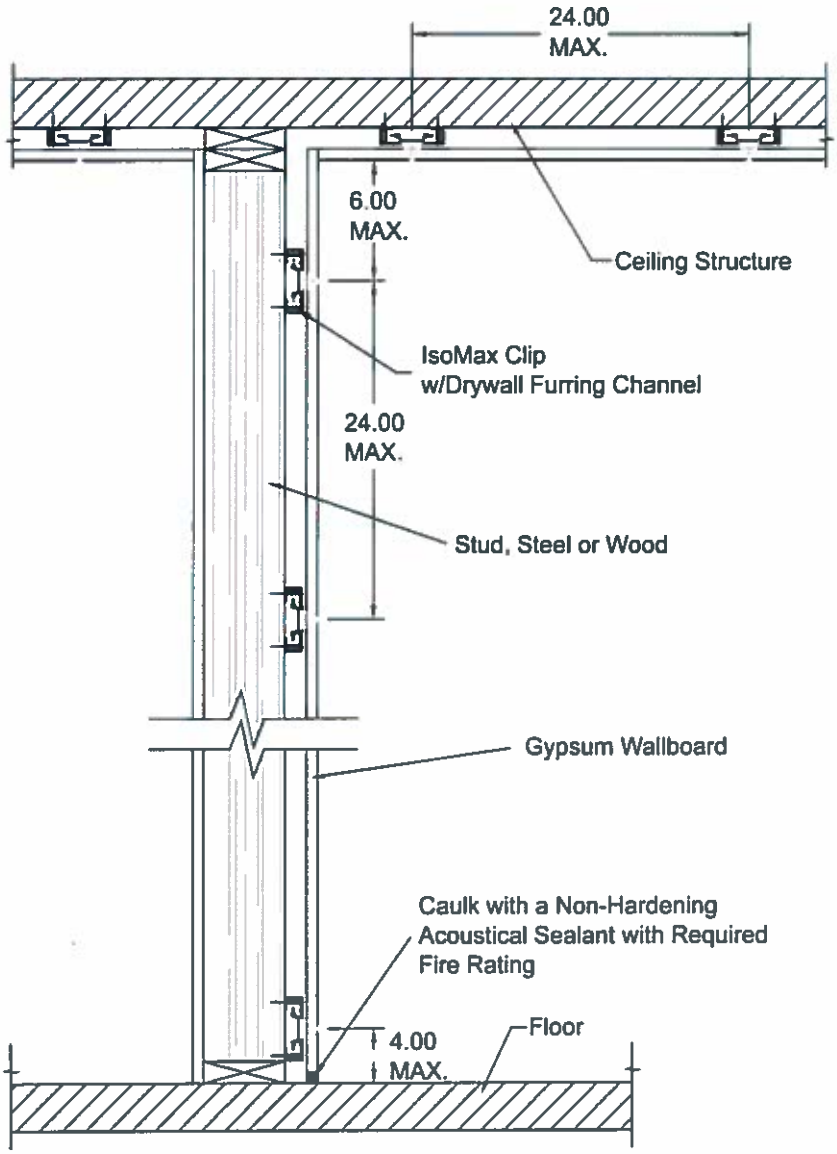
Side View

Resilient Sound Isolation Wall and Ceiling Clip

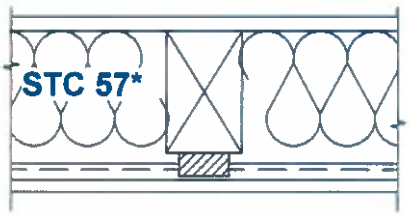
Model IsoMax

Benefits:

- Highly effective sound control at lowest installed cost.
- Quick and easy to install with standard drywall furring channel.
- Weight capacity - 50 lbs. per clip maximum.
- Maximizes available occupied space with low-profile design.
- Performance range of STC 57 to STC 64 per laboratory tests, a substantial improvement vs. resilient channel.
- Eliminates problem of hard attaching that is common with resilient channel.
- UL fire rated wall and ceiling assemblies are available with IsoMax

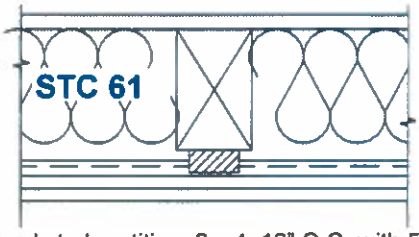


Tested Composite Wall Constructions per ASTM E90 and ASTM E413 at Riverbank Labs.

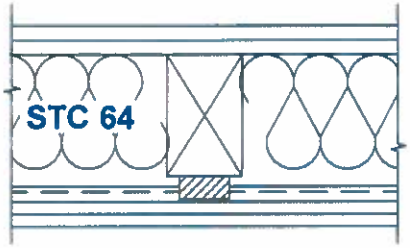


Wood Stud partition, 2 x 4, 16" O.C. with 5/8" gypsum board, one layer each side. R19 fiberglass in cavity. IsoMax clips and 7/7" furring channel.

*** +7 STC improvement** compared to the same wall with resilient channel. Find details in our report; IsoMax vs RC.



Wood stud partition, 2 x 4, 16" O.C. with 5/8' gypsum board, one layer one side, two layers on opposite side. R19 fiberglass in cavity. IsoMax clips and 7/8" furring channel.



Wood stud partition, 2 x 4, 16" O.C. with 5/8" gypsum board, two layers on each side. R19 fiberglass in cavity. IsoMax clips and 7/8" furring channel.

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Download Model IsoMax information including three-part specification, installation guidelines, and typical installation drawings at **www.kineticsnoise.com/arch/isomax**. *Call the factory at 800-959-1229 if needing additional information; ask for Architectural sales. Purchase Model IsoMax and accessories through your local sales representative* **(www.kineticsnoise.com/replocation.asp)**.