

## CVS Distribution Center Chiller Equipment, Screen Wall and Parking Lot SP 10-09

**CVS Distribution Center Chiller Equipment, Screen Wall and Parking Lot  
SITE PLAN NO. 10-09**

Public hearing on the request of CVS Pharmacy, for Special Land Use Permit and Preliminary Site Plan approval. The subject property is located in Section 22, west of Novi Road, south of Grand River Avenue, in the I-1, Light Industrial District. The subject property is approximately 22 acres and the applicant is proposing to remove 7 parking spaces in order to place an 888 square foot chiller equipment and screen wall compound and add an additional 11 parking spaces to serve the existing 460,000 square foot CVS distribution center building.

**Required Action**

Approve/deny the Special Land Use Permit and Preliminary Site Plan.

| REVIEW      | RESULT                  | DATE    | COMMENTS   |
|-------------|-------------------------|---------|--|
| Planning    | Approval<br>Recommended | 2/12/10 | <ul style="list-style-type: none"> <li>• <b>ZBA variance to locate chiller in side yard</b> (supported by Staff)</li> <li>• <b>ZBA variance to permit 63 inch tall piping on roof without screening</b> (supported by Staff)</li> <li>• <b>Planning Commission acceptance of noise statement and waiver of Noise Analysis</b></li> <li>• <b>Planning Commission waiver of raised parking lot islands</b> (supported by Staff)</li> <li>• Minor items to be addressed at time of Final Site Plan submittal</li> </ul> |
| Engineering | Approval<br>Recommended | 2/12/10 | <ul style="list-style-type: none"> <li>• Minor items to be addressed at time of Final Site Plan submittal</li> </ul>   |
| Façade      | Meets requirements      | 2/16/10 |  |

3/10/10

## Motions

### Approval – Special Use Permit

In the matter of CVS Distribution Center Chiller Equipment, Screen Wall and Parking Lot, SP10-09, motion to **approve** the Special Use Permit for accessory chiller equipment, screen wall and parking lot modifications subject to the following:

- a. Planning Commission finding under Section 2516.2.c for the Special Land Use permit:  
Whether, relative to other feasible uses of the site,
  - The proposed use will not cause any detrimental impact on existing thoroughfares (*due to the fact that the addition of the accessory cooler and additional parking spaces will not create any additional traffic*).
  - The proposed use is compatible with adjacent uses of land in terms of location, size, character, and impact on adjacent property or the surrounding neighborhood (*due to the fact that the proposed equipment will not be visible and should not generate an excessive amount of noise since it will be located on opposite side of the building from the neighboring residential and surrounded by a screen wall*);
  - The proposed use is consistent with the goals, objectives and recommendations of the City's Master Plan for Land Use.
  - The proposed use will promote the use of land in a socially and economically desirable manner.
  - The proposed use is in harmony with the purposes and conforms to the applicable site design regulations of the zoning district in which it is located (*as noted in the staff and consultant's review letters*);
- b. Obtaining a variance from the Zoning Board of Appeals for the following:
  - a. Location of accessory equipment in side yard;
  - b. Permit roof top equipment that exceeds five feet and
  - c. Permit roof top equipment without screening
- d. Planning Commission waiver of required Noise Analysis because the submitted Noise Impact Statement indicates an acceptable analysis of the projected noise level and due to the proposed location of the equipment on the east side of the building and behind a screen wall (*or the applicant providing a Noise Analysis demonstrating acceptable noise levels at Final Site Plan submittal*) ;
- e. Compliance with the amended Consent Judgment between the City of Novi and CVS Michigan Distribution, Inc. and CVS Pharmacy, Inc. on February 13, 2004 especially not causing an attendant increase in noise coming to the neighboring residential properties;
- f. Compliance with all conditions and requirements listed in the staff and consultant review letters; and
- c. (*additional other conditions here*)

### Denial – Special Use Permit

In the matter of CVS Distribution Center Chiller Equipment, Screen Wall and Parking Lot, SP10-09, motion to **deny** the Special Use Permit for accessory chiller equipment, screen wall and parking lot modifications for the following reasons....(*because it does not meet the following standards of the ordinance for approval of a Special Land Use permit...*)

**Approval – Preliminary Site Plan**

In the matter of CVS Distribution Center Chiller Equipment, Screen Wall and Parking Lot, SP10-09, motion to **approve** the Preliminary Site Plan for accessory chiller equipment, screen wall and parking lot modifications subject to the following:

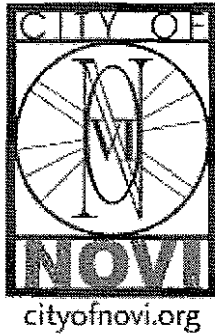
- a. Obtaining a variance from the Zoning Board of Appeals for the following:
  - Location of accessory equipment in side yard;
  - Permit roof top equipment that exceeds five feet and
  - Permit roof top equipment without screening
- b. Planning Commission waiver to replace raised parking lot islands with striped islands because the new parking spaces would be located on existing pavement;
- c. Compliance with all conditions and requirements listed in the staff and consultant review letters; and
- d. *(additional other conditions here)*

for the following reasons...*(because it is otherwise in compliance with Article 19, Section 2400 and Article 25 of the Zoning Ordinance and all other applicable provisions of the Ordinance).*

**Denial Preliminary Site Plan**

In the matter of CVS Distribution Center Chiller Equipment, Screen Wall and Parking Lot, SP10-09, motion to **deny** the Preliminary Site Plan for accessory chiller equipment, screen wall and parking lot modifications following reasons... *because it is not in compliance with Section \_\_\_\_\_ of the Zoning Ordinance.)*

## PLANNING REVIEW



## PLAN REVIEW CENTER REPORT

February 12, 2010

### Planning Review

CVS Distribution Center Chiller  
SP10-09

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#### **Petitioner**

CVS Pharmacy

#### **Review Type**

Preliminary Site Plan and Special Land Use Permit

#### **Property Characteristics**

- Site Location: North side of Gen-Mar Drive west of Novi Road in Section 22
- Site Size: 22 acres
- Zoning: I-1, Light Industrial
- Surrounding Zoning: North: TC, Town Center; East and South: I-1; West: R-4, One-Family Residential
- Surrounding Land Uses: North: CSX Railroad and further north cement plant; East and South: warehouse/industrial buildings; West: single family homes
- School District: Novi Community Schools
- Proposed: 888 square foot chiller, screen wall and parking lot improvements
- Plan Date: January 28, 2010

#### **Project Summary**

The applicant is proposing to remove 7 parking spaces, install chiller equipment with a footprint of 888 square feet, install an 8.5 foot tall screen wall around three sides of the chiller, place piping for the cooling system on the roof and add an additional 11 parking spaces within the existing paved areas of the site to serve the existing CVS distribution center building. The 460,000 square foot building was originally built in the 1980s and expanded to its current size in the mid 1990s after obtaining from the Planning Commission Site Plan and Special Land Use approval in 1995 (SP95-25). Accessory structures are permitted in the I-1, Light Industrial District with a Special Use Permit when located on properties adjacent to residential zoning districts. The current Preliminary Site Plan and Special Land Use Permit application is for the installation of the chiller and associated screen wall and modification to parking spaces within the current paved portion of the site only. No new paving is proposed.

#### **Recommendation**

The Preliminary Site Plan and Special Land Use Permit are **recommended for approval** subject to the applicant making the corrections listed in this letter and/or obtaining the appropriate variances from the Zoning Board of Appeals.

**Comments:**

The Preliminary Site Plan and Special Land Use request was reviewed under the general requirements of Article 19, Light Industrial District and Section 2400, the Schedule of Regulations of the Zoning Ordinance, and other sections of the ordinance, as noted. Please see the attached chart for information pertaining to ordinance requirements. Applicable sections of the Zoning Ordinance and other regulatory documents are highlighted on the attached chart. Items in **bold** below must be addressed by the applicant or Planning Commission before Site Plan and Special Land Use approval may be granted. Items underlined need to be addressed at the time of Final Site Plan Review:

1. **Schedule of Regulations** The plans demonstrate general compliance with the standards of Section 2400, the Schedule of Regulations, relating to building and parking setbacks and maximum building height. A variance was received to construct the existing parking and no additional paving is proposed with this application.
2. **Accessory Structures** (Section 2503) In the I-1 District, accessory structures are required to be placed in the rear yard. The applicant is proposing to place a chiller and screen wall in the side yard. The applicant is asked to **relocate the chiller or obtain a variance from the Zoning Board of Appeals** to place the chiller in the proposed location. The *Planning Staff supports this variance* since the location is the most screened from the neighboring residential properties and will offer the most noise attenuation because the warehouse building will block most of the sound from the chiller from reaching the neighboring residential properties.
3. **Parking Spaces** (Sections 2505, 2506 and Michigan Barrier Free Code) The Zoning Ordinance requires one parking space for every 700 square feet of useable floor space for warehouses and allows the Planning Commission to "bank" part of the required parking spaces. The Commission can reduce the required developed parking spaces to five spaces plus one for each employee on the greatest shift or five spaces plus one space per 1,700 square feet of usable floor area, which ever is greater when the applicant provides an area on the site to build the "banked" parking spaces should they be needed in the future. The warehouse building was approved by the Planning Commission (SP95-25) with 198 developed parking spaces and 268 "banked" parking spaces. The applicant now proposes to relocate seven parking spaces and add an additional four parking spaces. The proposed Site Plan increases the "banked" parking spaces from 268 to 311.

The applicant has provided six barrier free spaces but Michigan Barrier Free Code requires seven parking spaces. The applicant is asked to provide one additional barrier free space.

Parking bays that abut traffic circulation aisles are required to be separated from the aisles by raised end islands. The Planning Commission may waive this requirement and permit painted end islands where raised islands are inappropriate. The applicant is proposing to expand the current parking bays and add painted end islands. The applicant is asked to either **provide the raised end islands or obtain a waiver from the Planning Commission.** The *Planning Staff supports a waiver* because currently these parking bays do not have end islands and permitting painted end islands would provide additional area for trucks to maneuver on the site.

**4. Roof Top Equipment** (Section 2503) The Zoning Ordinance requires all roof top equipment to be less than 5 foot high and screened from view of the neighboring properties. The applicant is proposing to place on the roof a network of piping to support the cooling system. They proposed to mount it 63 inches off of the roof and do not propose any screening. The applicant is asked to **remove or lower and screen the piping or obtain a variance from the Zoning Board of Appeals**. The *Planning Staff supports a variance* since the pipes are only 6 inches in diameter and as designed would be less visible and intrusive in appearance than the typical sheet metal screening that is usually installed to screen roof top appurtenances.

**5. Special Land Use Considerations** Accessory uses and structures are permitted as special land uses on parcels adjacent to residentially zoned parcels in the I-1 District subject to Planning Commission approval.

The Zoning Ordinance requires the submittal of a noise analysis prepared by a certified sound engineer to help the Planning Commission determine if the proposed use exceeds allowable noise standards of the Ordinance. The applicant has submitted a noise impact statement and is asking the Planning Commission to **waive the noise analysis requirement**. The Planning Staff has reviewed the noise impact statement provided and based on the manufacturer's data, the engineer's statements, the equipment being surrounded by a screen wall and the location of the equipment on opposite side of the building from neighboring residential properties, the noise impact statement appears to present an accurate analysis.

The Planning Commission in exercising its discretion over site plan approval should consider the following factors relative to other feasible uses of the site:

- Whether the proposed use will cause any detrimental impact on existing thoroughfares in terms of overall volumes, capacity, safety, vehicular turning patterns, intersections, view obstructions, line of sight, ingress and egress, acceleration/deceleration lanes, off-street parking, off-street loading/unloading, travel times and thoroughfare level of service.
- Whether the proposed use will cause any detrimental impact on the capabilities of public services and facilities, including water service, sanitary sewer service, storm water disposal and police and fire protection to service existing and planned uses in the area.
- Whether the proposed use is compatible with the natural features and characteristics of the land, including existing woodlands, wetlands, watercourses and wildlife habitats.
- Whether the proposed use is compatible with adjacent uses of land in terms of location, size, character, and impact on adjacent property or the surrounding neighborhood.
- Whether the proposed use is consistent with the goals, objectives and recommendations of the City's Master Plan for Land Use.
- Whether the proposed use will promote the use of land in a socially and economically desirable manner.
- Whether the proposed use is (1) listed among the provision of uses requiring special land use review as set forth in the various zoning districts of this Ordinance, and (2)

is in harmony with the purposes and conforms to the applicable site design regulations of the zoning district in which it is located.

## 6. Other Issues

- **Pre-Construction Meeting** Prior to the start of any work on the site, Pre-Construction (Pre-Con) meetings must be held with the applicant's contractor and the City's consulting engineer. Pre-Con meetings are generally held after Stamping Sets have been issued and prior to the start of any work on the site. There are a variety of requirements, fees and permits that must be issued before a Pre-Con can be scheduled. Contact Sarah Marconi for a sample checklist or to schedule a Pre-Construction Meeting at 248-347-0430 or [smarchioni@cityofnovi.org](mailto:smarchioni@cityofnovi.org).
- **Future Parking Lot Expansion** The City has received notice from the Michigan Department of Natural Resources and the Environment of a pending public hearing for a permit to fill wetland and discharge stormwater into a wetland to facilitate parking lot improvements on the CVS Distribution Center site. City of Novi Site Plan, Special Land Use Permit and/or Wetland Permit approval will be required to expand the parking lot. The City of Novi will hold a public hearing before approving any Wetland or Special Land Use Permit. The City has not received an application for a parking lot expansion. The applicant is asked to clarify its intentions and to submit the appropriate applications to the City.

**7. Response Letters** A letter from either the applicant or the applicant's representative addressing comments in this, and in the other review letters, is requested prior to the matter being reviewed by the Planning Commission. Additionally, a letter from the applicant is requested to be submitted with the Final Site Plan highlighting the changes made to the plans addressing each of the comments listed above, and with any conditions of Planning Commission approval.

Please contact Mark Spencer at (248) 735-5607 or [m Spencer@cityofnovi.org](mailto:m Spencer@cityofnovi.org) with any questions or concerns.



Prepared by Mark Spencer, AICP, Planner

Attachment: Planning Review Chart



## PLANNING REVIEW SUMMARY CHART

**Review Date:** February 5, 2010  
**Project Name:** CVS Distribution Center Chiller  
**Project Number:** SP10-09  
**Plan Date:** January 28, 2010

Items in **Bold** need to be addressed by the applicant and/or the Planning Commission before approval of the Preliminary Site Plan. Underlined items need to be addressed on the Final Site Plan.

| Item   | Required                                     | Proposed                        | Meets Requirements ? | Comments   |
|--|--|---------------------------------|----------------------|--|
| Master Plan  | Light Industrial                             | No change proposed              | Yes                  |  |
| Zoning   | I-1, Light Industrial                        | No change proposed              | Yes                  |  |
| Uses Permitted Subject to Special Conditions when abutting a residential district (1902) | Warehousing                                  | No Change                       | Yes/No               | Use previously approved subject to Special Conditions – <b>Accessory structures require Planning Commission Special Land Use Permit approval</b>   |
| Noise Analysis (1905.10 and 2519.10.C.ii.)   | Noise Analysis by certified sound engineer   | Noise impact statement provided | No                   | <b>Submit a noise analysis or ask for a Planning Commission waiver</b> (the equipment does not face the neighboring residential properties, the equipment is over 500 feet from the residential properties, the building is in between the chiller and the residential properties and the equipment is behind a screen wall) |
| Building Height (Section 2400, Schedule of Regulations & 2503.2.E)                       | 25 ft. when adjacent to residential district | No change                       | Yes                  |  |
| <b>Building Setback No changes proposed</b>  |  |                                 |                      |  |
| Accessory Structures – Proposed chiller unit   |  |                                 |                      |  |
| Location 2503.2.A.   | Must be in rear yard                         | Side yard proposed              | No                   | <b>Move to rear yard or seek variance from ZBA</b>   |
| Main Building Setback 2503.1.G.  | 10 ft. from any main building                | 10 ft.                          | Yes                  |  |
| Setback from side or rear lot line (2503.1.G.)   | 6 ft.  | 120+ ft.                        | Yes                  |  |

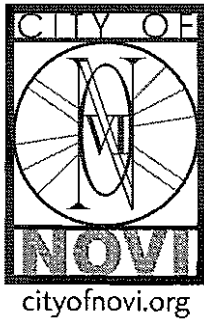
| Item  | Required   | Proposed   | Meets Requirements ? | Comments                     |
|---|--|--|----------------------|------------------------------|
| <b>Parking Setback</b>                                |  |  |                      |                              |
| Front south (2400 h)                                  | 40 ft.   | No Change  | Yes                  |                              |
| Side east interior (2400 h and c)                     | 10 ft.   | 5 ft. existing No Change   | Yes                  | Variance previously granted  |
| Rear north (2400 h and c)                             | 10 ft.   | Existing and proposed deferred parking at 10 feet  | Yes                  |                              |
| Side west interior(1905.4 .b.(2))                     | 100 ft. when adjacent to residential includes drives – must be effectively screened  | Existing and proposed deferred parking at 75 ft.   | Yes                  | Previously approved location |
| Number of Parking Spaces (2505.14.e (2)(i) &(ii))     | <p>One space per 700 sq. ft. useable area – With Planning Commission approval may reduce to 5 + one per employee on greatest shift or 5 spaces + one for every 1700 sq. ft. useable floor area, whichever is greater</p> <p>Approval of previous site plan subject to Special Conditions required 197 parking spaces (August 1995)<br/>           One space for every 1,700 sq. ft. usable floor space<br/> <b>(326,221/1700=197)</b><br/>           with the provision of providing space for an <b>additional 268 spaces if needed</b> at one space for every 700 sq. ft. of usable floor area<br/> <b>(326,221/700=466)</b></p> | <p>Total 466 spaces required including banked 197 minimum developed spaces</p> <p>Existing 471 spaces provided 198 developed and 273 banked (on approved SP95-25)</p> <p>Proposed<br/> <b>211 developed</b><br/> <b>311 banked</b><br/> <b>522 total</b></p> | Yes                  |                              |
| Parking Space Dimensions and Maneuvering Lanes (2506) | 9 ft. x 19 ft. parking space dimensions and 24 ft. wide two-way drives. 9 ft. x 17 ft. parking spaces allowed along 7 ft. wide interior sidewalks as long as detail indicates a 4" curb at   | 24 ft. aisle with 9 ft. by 19 ft. spaces   | Yes                  |                              |

| Item   | Required   | Proposed  | Meets Requirements ? | Comments  |
|--|--|---|----------------------|---|
|  | these locations and along landscaping. Min. 22 ft. two-way drives permitted with no adjacent parking – min. 12 ft. one way drives permitted with no adjacent parking – required fire lanes must be min. 18 ft. wide.   |   |                      |   |
| End Islands (Section 2506.13)                            | End Islands with landscaping and raised curbs are required at the end of all parking bays that abut traffic circulation aisles. The end islands shall generally be at least 8 feet wide, have an outside radius of 15 feet, and be constructed 3' shorter than the adjacent parking stall. | Painted end islands proposed                      | No                   | Planning Commission may grant a waiver where volumes are low or where raised islands are inappropriate  |
| Barrier Free Spaces (Barrier Free Code)                  | 7 barrier free spaces required: 5 standard barrier free, 2 van accessible (not including deferred).  | 3 standard & 3 van accessible barrier free spaces | No                   | Add one barrier free space<br>Note: Barrier free spaces are required to be the closest spaces to the building – Relocate new barrier free space near center of building |
| Barrier Free Space Dimensions (Barrier Free Code)        | 8' wide with a 5' wide access aisle for standard barrier free spaces, and 8' wide with an 8' wide access aisle for van accessible spaces   | Access aisles provided                            | Yes                  |   |
| Barrier Free Signs (Barrier Free Design Graphics Manual) | One sign for each accessible parking space.  | Provided for new spaces                           | Yes                  |   |
| Exterior lighting (Section 2511)                         | Photometric plan and exterior lighting details needed at time of Final Site Plan submittal   | Existing  | Yes                  |   |

| <b>Item</b>  | <b>Required</b>   | <b>Proposed</b>                                 | <b>Meets Requirements ?</b> | <b>Comments</b>  |
|--|---|---|-----------------------------|--|
| Roof top equipment and wall mounted utility equipment (Section 2503.2.E.(1)) | All roof top equipment must be screened and all wall mounted utility equipment must be enclosed and integrated into the design and color of the building maximum height 5 foot above roof | 6 inch piping proposed 63 inches above the roof | <b>No</b>                   | <b>Remove roof top equipment, lower the height below 5 feet and screen the equipment or obtain a variance from the ZBA</b> |

Prepared by Mark Spencer, AICP, Planner (248) 735-5607

## ENGINEERING REVIEW



# PLAN REVIEW CENTER REPORT

February 12, 2010

## **Engineering Review**

CVS Pharmacy Distribution Center  
SP10-09

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### **Petitioner**

CVS Pharmacy

### **Review Type**

Preliminary/Final Site Plan

### **Property Characteristics**

- Site Location: Novi Road, South of the CSX Rail Road
- Site Size: 2.00 acres
- Plan Date: 11-8-2009

### **Project Summary**

- Installation of a chiller unit and screening wall in the place of eight current parking spaces. The applicant is proposing adding 15 spaces to compensate for the lost spaces. Additionally, the land banked parking plan for the site has been revised.

### **Recommendation**

**Approval of the Preliminary/Final Site Plan is recommended, with items to be addressed at Stamping Set submittal.**

### **Comments:**

The Preliminary/Final Site Plan meets the general requirements of Chapter 11 of the Code of Ordinances, the Storm Water Management Ordinance and the Engineering Design Manual with the following exceptions, which can be addressed at Stamping Set submittal:

General

1. Provide a note on the plans that all work shall conform to the current City of Novi standards and specifications.
2. A Planning Commission waiver is required for the proposed striped end islands. Due to the fact that no redevelopment is being proposed and the fact that the majority of the site currently has painted end islands, the Engineering Division will support that waiver.
3. The proposed land banked parking shows that underground detention would be proposed if additional parking is required. If this ever came up, a separate detailed site plan would need to be submitted and any additional impervious area would need to be detained for the 100-year storm volume.

Paving & Grading

4. Even though striped end islands are being proposed, they shall still meet current City of Novi Design Standards and dimensions. All end islands shall end three feet short of the stall length.
5. The end island on the west side of the loading spaces will need a rounded end and also end three feet short of the stall length.

**The following must be submitted with the Stamping Set:**

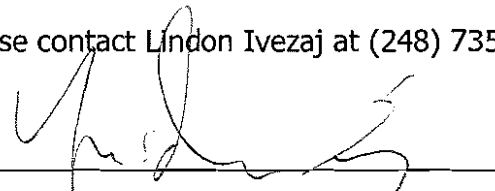
(Please note that all documents must be submitted together as a package with the Stamping Set submittal. Partial submittals will not be accepted).

6. A letter from either the applicant or the applicant's engineer must be submitted with the Stamping Set highlighting the changes made to the plans addressing each of the comments listed above and indicating the revised sheets involved. **Additionally, a statement must be provided stating that all changes to the plan have been discussed in the applicant's response letter.**

**The following must be addressed prior to construction:**

7. Traffic inspection fees (for striping and signage) in the amount of \$412.50 must be paid to the City Treasurer's Office.
8. A street sign financial guarantee in the amount of \$1,600 (\$400 per traffic control sign proposed) must be posted at the Treasurer's Office. Signs must be installed in accordance with MMUTCD standards.

Please contact Lindon Ivezaj at (248) 735-5694 with any questions.



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cc: Ben Croy, Engineering  
Brian Coburn, Engineering  
Mark Spencer, Planner  
Sheila Weber, Treasurer's

## FAÇADE REVIEW





Phone: (248) 880-6523  
 E-Mail: [dtecci@drnarchitects.com](mailto:dtecci@drnarchitects.com)  
 Web: [drnarchitects.com](http://drnarchitects.com)

DRN & ASSOCIATES, ARCHITECTS, PC

50850 Applebrooke Dr., Northville, MI 48167



February 16, 2010

City of Novi Planning Department  
 45175 W. 10 Mile Rd.  
 Novi, MI 48375-3024

Re: **FACADE ORDINANCE**  
**CVS Pharmacy Distribution Center - Facade Addition**  
**SP 10-09**  
 Façade Region: 3  
 Zoning District: I-1

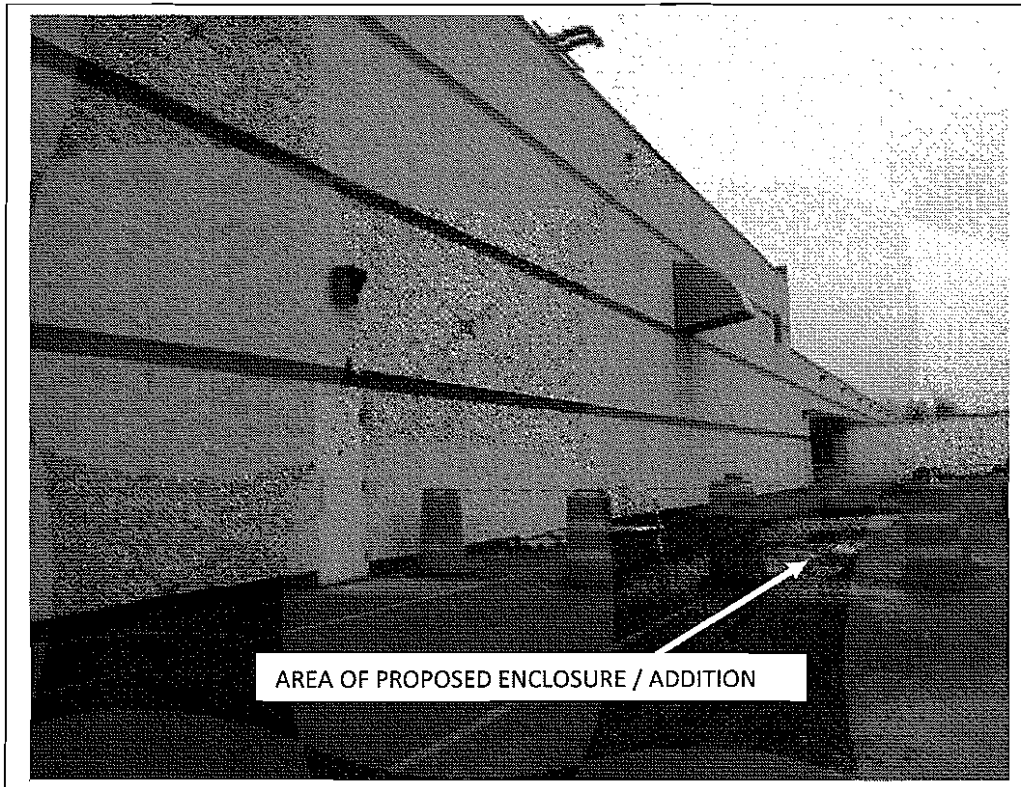
Dear Ms. McBeth;

The following is the Facade Review for Final Site Plan for the above referenced project based on the drawings prepared by Fairway Engineering, dated 1/28/10. The percentages of materials proposed for each façade are as shown on the table below. The maximum (and minimum) percentages allowed by the Schedule Regulating Façade Materials of Ordinance Section 2520 are shown in the right hand column. Materials in non-compliance with the Facade Schedule are highlighted in bold.

The applicant is proposing the addition of an 8.5' high screen wall around a proposed chiller unit on the east elevation of the building. This project has been treated as an addition, as described in section 2520.7 of the Facade Ordinance. Only the east facade of the building is affected by this addition.

|                                      | East         | West | South | North | Ordinance Maximum (Minimum) |
|--------------------------------------|--------------|------|-------|-------|-----------------------------|
| Split Faced CMU - Painted            | <b>95.0%</b> | NA   | NA    | NA    | 75%                         |
| Striated CMU - Painted (Accent Band) | <b>5.0%</b>  | NA   | NA    | NA    | 25%                         |

As shown above the percentages of CMU block exceed the maximum percentages allowed by the Ordinance. The screen wall is proposed to be constructed of materials that are the same as existing materials. This is consistent with paragraph 2520.6 of the facade Ordinance which states that for additions a continuation of existing materials may be used when certain criteria are met; 1 - the addition must not exceed 100% of the building floor area, 2 - the new materials are consistent with existing materials with respect to color, texture, size and location, 3 - that the overall visual effect is to make the addition appear as part of the existing building, and 4 - that the building is not in the TC or TC-1 Districts. All of these conditions have been met.



**Recommendations:** All of the conditions for approval of a facade addition described in section 2520.6 of the Facade Ordinance have been met. Therefore, this application qualifies for administrative approval under section 2516.c.10 of the Zoning Ordinance.

**Notes to the Applicant:**

1. Inspections - The City of Novi requires Façade Inspection(s) for all projects. Materials displayed on the approved sample board will be compared to materials delivered to the site. It is the applicant's responsibility to request the inspection of each façade material at the appropriate time. This should occur immediately after the materials are delivered. Materials must be approved before installation on the building. Please contact the Novi Building Department's Automated Inspection Hotline at (248) 347-0480 to request the Façade inspection.

If you have any questions please do not hesitate to call.

Sincerely,  
DRN & Associates, Architects PC

A handwritten signature in black ink, appearing to read "Douglas R. Necci".

Douglas R. Necci, AIA

**APPLICANT RESPONSE LETTER(S)**

# FAIRWAY ENGINEERING LLC

Land Development-Geotechnical-Structural  
23965 Novi Road, Suite 140  
Novi, MI 48375

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February 26, 2010

Mr. Mark Spencer  
CITY OF NOVI  
Planning Department  
45175 West 10 Mile Road  
Novi, MI 48375

Re: Proposed Chiller and Air Rotation Units  
CVS/pharmacy  
43800 Gen-Mar Drive  
Novi, Michigan 48375

Dear Mr. Spencer:

Per your office comments in the preliminary review letter dated February 12, 2009, regarding the above referenced project, we have revised the site plans. Following revisions were made to the attached plans per each review comments. Your comments are in italics and our response is in highlighted regular lettering.

## PLANNING REVIEW

*The Preliminary Site Plan and Special Land Use request was reviewed under the general requirements of Article 19, Light Industrial District and Section 2400, the Schedule of Regulations of the Zoning Ordinance, and other sections of the ordinance, as noted. Please see the attached chart for information pertaining to ordinance requirements. Applicable sections of the Zoning Ordinance and other regulatory documents are highlighted on the attached chart. Items in **bold** below must be addressed by the applicant or Planning Commission before Site Plan and Special Land Use approval may be granted. Items underlined need to be addressed at the time of Final Site Plan Review:*

- 1. **Schedule of Regulations** The plans demonstrate general compliance with the standards of Section 2400, the Schedule of Regulations, relating to building and parking setbacks and maximum building height. A variance was received to construct the existing parking and no additional paving is proposed with this application.*
- 2. **Accessory Structures** (Section 2503) In the I-1 District, accessory structures are required to be placed in the rear yard. The applicant is proposing to place a chiller and screen wall in the side yard. The applicant is asked to **relocate the chiller or obtain a variance from the Zoning Board of Appeals** to place the chiller in the proposed location. The Planning Staff supports this variance since the location is the most screened from the neighboring residential properties and will offer the most noise attenuation because the warehouse building will block most of the sound from the chiller from reaching the neighboring residential properties.*

**We are requesting variance from ZBA for the chiller unit to be in side yard.**

- 3. **Parking Spaces** (Sections 2505, 2506 and Michigan Barrier Free Code) The Zoning Ordinance requires one parking space for every 700 square feet of useable floor space for warehouses and allows the Planning Commission to "bank" part of the required parking spaces. The Commission can reduce the required developed parking spaces to five spaces plus one for each employee on the greatest shift or five spaces plus one space per 1,700 square feet of usable floor area, whichever is greater when the applicant provides an area on the site to build the "banked" parking spaces should they be needed in the future. The warehouse building was approved by the*

# FAIRWAY ENGINEERING LLC

Land Development-Geotechnical-Structural  
23965 Novi Road, Suite 140  
Novi, MI 48375

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*Planning Commission (SP95-25) with 198 developed parking spaces and 268 "banked" parking spaces. The applicant now proposes to relocate seven parking spaces and add an additional four parking spaces. The proposed Site Plan increases the "banked" parking spaces from 268 to 311.*

*The applicant has provided six barrier free spaces but Michigan Barrier Free Code requires seven parking spaces. The applicant is asked to provide one additional barrier free space.*

*Parking bays that abut traffic circulation aisles are required to be separated from the aisles by raised end islands. The Planning Commission may waive this requirement and permit painted end islands where raised islands are inappropriate. The applicant is proposing to expand the current parking bays and add painted end islands. The applicant is asked to either **provide the raised end islands or obtain a waiver from the Planning Commission.** The Planning Staff supports a waiver because currently these parking bays do not have end islands and permitting painted end islands would provide additional area for trucks to maneuver on the site.*

**A waiver from planning commission is requested for the striped island instead of curbed islands as required by the ordinance.**

- 4. Roof Top Equipment** (Section 2503) *The Zoning Ordinance requires all roof top equipment to be less than 5 foot high and screened from view of the neighboring properties. The applicant is proposing to place on the roof a network of piping to support the cooling system. They proposed to mount it 63 inches off of the roof and do not propose any screening. The applicant is asked to **remove or lower and screen the piping or obtain a variance from the Zoning Board of Appeals.** The Planning Staff supports a variance since the pipes are only 6 inches in diameter and as designed would be less visible and intrusive in appearance than the typical sheet metal screening that is usually installed to screen roof top appurtenances.*

**A variance is requested from ZBA for air rotation pipe height (63") above the existing roof.**

- 5. Special Land Use Considerations** *Accessory uses and structures are permitted as special land uses on parcels adjacent to residentially zoned parcels in the I-1 District subject to Planning Commission approval.*

*The Zoning Ordinance requires the submittal of a noise analysis prepared by a certified sound engineer to help the Planning Commission determine if the proposed use exceeds allowable noise standards of the Ordinance. The applicant has submitted a noise impact statement and is asking the Planning Commission to **wave the noise analysis requirement.** The Planning Staff has reviewed the noise impact statement provided and based on the manufacturer's data, the engineer's statements, the equipment being surrounded by a screen wall and the location of the equipment on opposite side of the building from neighboring residential properties, the Planning Staff recommends waiving the requirement for a noise analysis.*

*The Planning Commission in exercising its discretion over site plan approval should consider the following factors relative to other feasible uses of the site:*

- Whether the proposed use will cause any detrimental impact on existing thoroughfares in terms of overall volumes, capacity, safety, vehicular turning patterns, intersections, view obstructions, line of sight, ingress and egress, acceleration/deceleration lanes, off-street parking, off-street loading/unloading, travel times and thoroughfare level of service.*
- Whether the proposed use will cause any detrimental impact on the capabilities of public services and facilities, including water service, sanitary sewer service, storm water disposal and police and fire protection to service existing and planned uses in the area*
- Whether the proposed use is compatible with the natural features and characteristics of the land, including existing woodlands, wetlands, watercourses and wildlife habitats.*
- Whether the proposed use is compatible with adjacent uses of land in terms of location, size, character, and impact on adjacent property or the surrounding neighborhood.*
- Whether the proposed use is consistent with the goals, objectives and recommendations of the City's Master Plan for Land Use.*

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Land Development-Geotechnical-Structural  
23965 Novi Road, Suite 140  
Novi, MI 48375

- 
- *Whether the proposed use will promote the use of land in a socially and economically desirable manner,*
  - *Whether the proposed use is (1) listed among the provision of uses requiring special land use review as set forth in the various zoning districts of this Ordinance, and (2) is in harmony with the purposes and conforms to the applicable site design regulations of the zoning district in which it is located.*

**A waiver from Planning Commission is requested for the noise analysis requirement.**

## 6. Other Issues

- **Pre-Construction Meeting** *Prior to the start of any work on the site, Pre-Construction (Pre-Con) meetings must be held with the applicant's contractor and the City's consulting engineer. Pre-Con meetings are generally held after Stamping Sets have been issued and prior to the start of any work on the site. There are a variety of requirements, fees and permits that must be issued before a Pre-Con can be scheduled. Contact Sarah Marconi for a sample checklist or to schedule a Pre-Construction Meeting at 248-347-0430 or [smarchioni@cityofnovi.org](mailto:smarchioni@cityofnovi.org).*

**We have contacted your building department in reference to this.**

- **Future Parking Lot Expansion** *The City has received notice from the Michigan Department of Natural Resources and the Environment of a pending public hearing for a permit to fill wetland and discharge storm water into a wetland to facilitate parking lot improvements on the CVS Distribution Center site. City of Novi Site Plan, Special Land Use Permit and/or Wetland Permit approval will be required to expand the parking lot; The City of Novi will hold a public hearing before approving any Wetland or Special Land Use Permit. The City has not received an application for a parking lot expansion. The applicant is asked to clarify its intentions and to submit the appropriate applications to the City.*

**A permit application is submitted to the MDEQ office for parking lot expansion if required for future use.**

## 7. Response Letters

*A letter from either the applicant or the applicant's representative addressing comments in this, and in the other review letters, is requested prior to the matter being reviewed by the Planning Commission. Additionally, a letter from the applicant is requested to be submitted with the Final Site Plan highlighting the changes made to the plans addressing each of the comments listed above, and with any conditions of Planning Commission approval.*

**This letter is submitted with the plans addressing all City review comments.**

## ENGINEERING REVIEW

*The Preliminary/Final Site Plan meets the general requirements of Chapter 11 of the Code of Ordinances, the Storm Water Management Ordinance and the Engineering Design Manual with the following exceptions, which can be addressed at Stamping Set submittal:*

### General

1. *Provide a note on the plans that all work shall conform to the current City of Novi standards and specifications.*

**A note is added to Sheet C-1 and C-3 per comment.**

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Novi, MI 48375

- 
2. *A Planning Commission waiver is required for the proposed striped end islands. Due to the fact that no redevelopment is being proposed and the fact that the majority of the site currently has painted end islands, the Engineering Division will support that waiver.*

**A variance is requested for striped islands instead of curbed island due to potential drainage issue.**

3. *The proposed land banked parking shows that underground detention would be proposed if additional parking is required. If this ever came up, a separate detailed site plan would need to be submitted and any additional impervious area would need to be detained for the 100-year storm volume.*

**If in future the parking area expansion occurs, a revised site plan addressing the detention requirement will be submitted to the City for approval.**

## Paving & Grading

4. *Even though striped end islands are being proposed, they shall still meet current City of Novi Design Standards and dimensions. All end islands shall end three feet short of the stall length.*

**The proposed islands are revised per City requirements.**

5. *The end island on the west side of the loading spaces will need a rounded end and also end three feet short of the stall length.*

**The islands are revised per comment.**

## ***The following must be submitted with the Stamping Set:***

*(Please note that all documents must be submitted together as a package with the Stamping Set submittal. Partial submittals will not be accepted).*

6. *A letter from either the applicant or the applicant's engineer must be submitted with the Stamping Set highlighting the changes made to the plans addressing each of the comments listed above and indicating the revised sheets involved. **Additionally, a statement must be provided stating that all changes to the plan have been discussed in the applicant's response letter.***

**This letter addresses all the review comments and revisions to the site plan set as required.**

## **The following must be addressed prior to construction:**

7. *Traffic inspection fees (for striping and signage) in the amount of \$412.50 must be paid to the City Treasurer's Office.*
8. *A street sign financial guarantee in the amount of \$1,600 (\$400 per traffic control sign proposed) must be posted at the Treasurer's Office. Signs must be installed in accordance with MMUTCD standards.*

**The required fees will be submitted to the City before construction.**

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Land Development-Geotechnical-Structural  
23965 Novi Road, Suite 140  
Novi, MI 48375

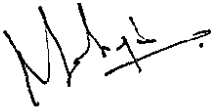
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The overall plan is to install air rotation system to provide comfort to the people working inside the building during extreme temperatures and reduce the current noise level. We will appreciate your approval or recommendation for approval with few variances requested as noted on the site plan.

All above changes were made by appropriate parties involved on the project in direct response to consultant comments and requests. Thank you for your assistance on this project. Please call us if you any question or require additional information.

Sincerely,

FAIRWAY ENGINEERING LLC



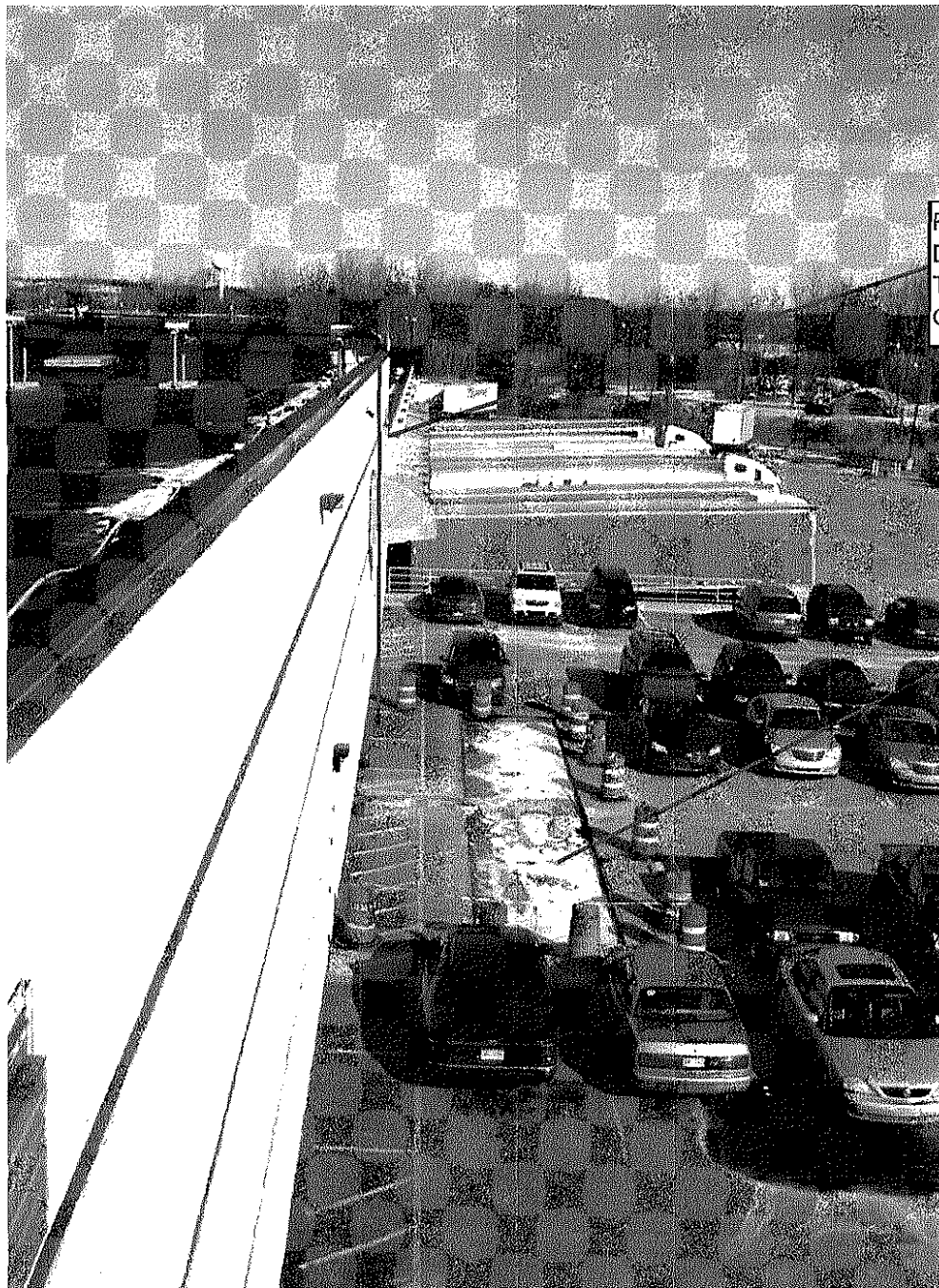
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Madhukar D. Mahajan, P.E.  
President/Owner

Cc: Jamie Howkinson, CVS/pharmacy



**ROOF TOP EQUIPMENT PICTURES**



PIPES WILL BE EXTENDED  
DOWNWARD ALONG THE WALL  
TO CONNECT TO CHILLER UNIT  
GC-1

PROPOSED CHILLER  
UNIT LOCATION

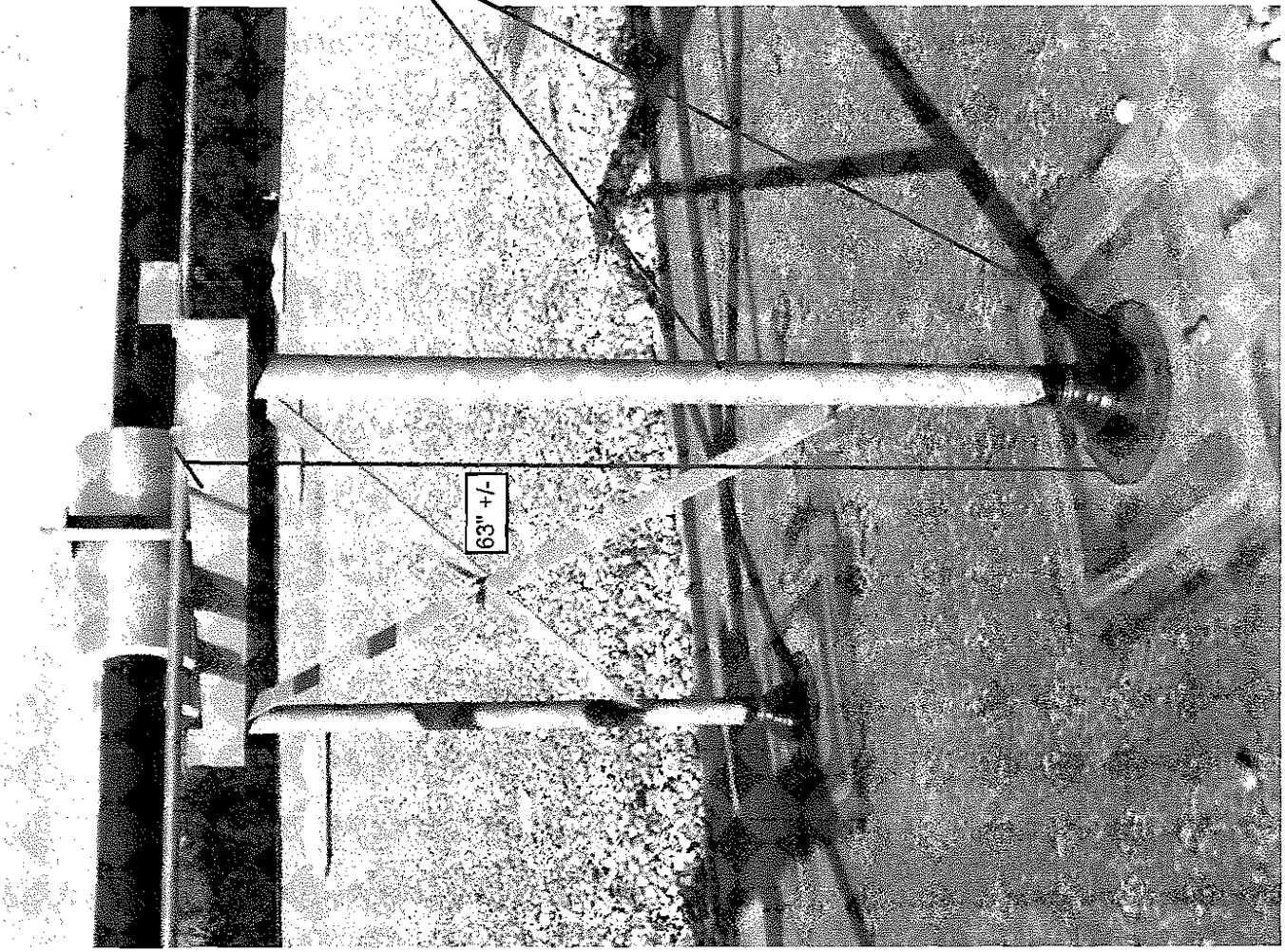
THE CHILLER UNIT WILL BE OPERATED MANUALLY. ON HOT HUMID DAYS (80 DEG. OR ABOVE TEMPERATURE WITH HIGH HUMIDITY) THE CHILLER UNIT WILL BE TURNED ON FOR COOL AIR ROTATION IN THE BUILDING. THERE ARE NO VENTS IN THE SYSTEM ABOVE ROOF. ONLY TWO 6" DIAMETER PIPES ARE INSTALLED FOR THE PROPOSED SYSTEM.

THE CHILLER UNIT WILL OPERATE 24 HOURS DURING EXTREAM TEMPERATURES.

CHILLER PIPING  
SYSTEM MOUNTED  
ON THE EXISTING  
ROOF



PIPING SUPPORT  
SYSTEM ANCHORED TO  
THE ROOF, EVERY FIFTH  
FRAME ALONG PIPING



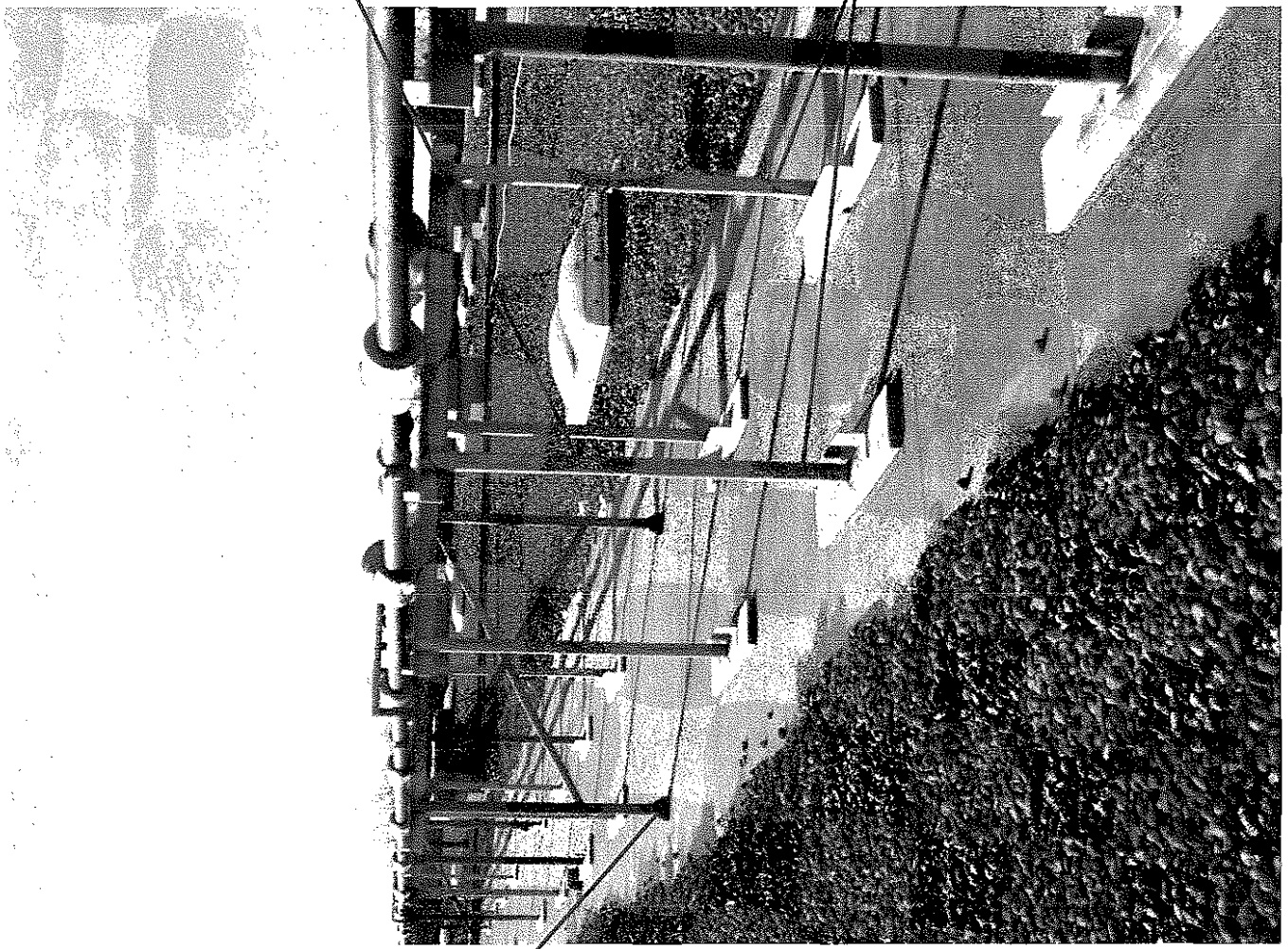
63" +/-



OVERALL VIEW OF THE  
PIPING SUPPORT  
SYSTEM

FLOATING  
SUPPORTS

ANCHORED  
SUPPORTS



**NOISE IMPACT STATEMENT**

# FAIRWAY ENGINEERING LLC

Land Development-Geotechnical-Structural  
23965 Novi Road, Suite 140  
Novi, MI 48375

---

February 10, 2010

Mr. Mark Spencer  
CITY OF NOVI  
Planning Department  
45175 West 10 Mile Road  
Novi, MI 48375

Re: Proposed Chiller and Air Rotation Units  
CVS/pharmacy  
43800 Gen-Mar Drive  
Novi, Michigan 48375

Dear Mr. Spencer:

This is in response to the two requested items in your e-mail dated February 5, 2010.

1. *Provide a noise impact statement prepared in accordance with Section 2519.10.c.i. Your manufacturer's sheets contain all of the information, but you need to present it into a short narrative. Example the 400 high emits xx dbs at 30 feet. Providing a sound wall reduces this by xx dbs. And being xx feet to property line reduces this another xx dbs. State hours of operation (24?)*

**Attached are the noise level computations based on the manufacturer's engineering bulletin. Based on the computations, the noise level generated from chiller unit GC-1 to the west property line is 22.8 dBA which is less than 50 dBA allowed at the night time. At all other property lines, abutting I-1 and TC zoning district, the noise level is below 70 dBA as permitted by the zoning ordinance Section 2519.10.c.i.**

**Attached is also a site plan sketch illustrating the critical locations and estimated dBA readings.**

2. *I need a clear detail for the roof vents. How high are they? Do they open and face the west? Are they screened? What color are they? Do they emit noise? If so explain in the above statement. The detail will be required on the stamping set.*

**From the chiller unit outside, there are two 6" diameter steel pipes going towards the air rotation units. The pipes run along the outside wall of the building and then on the roof of the building. On the roof the pipes are supported by galvanized steel frames. Intermittent supports are anchored to the existing roof system. Attached are some of the pictures taken during site visit. There are no vents in this system. The pipe supporting system is approximately 63" above the roof as illustrated in the photographs. The piping system is not screened but it is invisible from far distance beyond the property limits.**

Thank you for your assistance on this project. Please call us if you any question or require additional information.

Sincerely,

FAIRWAY ENGINEERING LLC



Madhukar D. Mahajan, P.E.  
President/Owner

## Sound Level Estimates from Chiller Unit G2-1

① Chiller Unit Noise level per manufacturer  
= 78 dBA.

② A barrier wall is placed on three sides of the chiller unit.

Noise level Just outside the wall =  $78 - 10 = 68$  dBA

③ The noise level reduction is approx.  $5 \text{ dBA}/100'$  based on the distance from the unit.

- At East Property Line

$$= 68 - \left(\frac{150}{100}\right) * 5 = 60.5 \text{ dBA.}$$

- At North East Corner of Property

$$= 68 - \left(\frac{411}{100}\right) * 5 = 47.45 \text{ dBA.}$$

- At South Property Line

$$= 68 - \left(\frac{665}{100}\right) * 5 = 34.75 \text{ dBA}$$



- At West Property Line

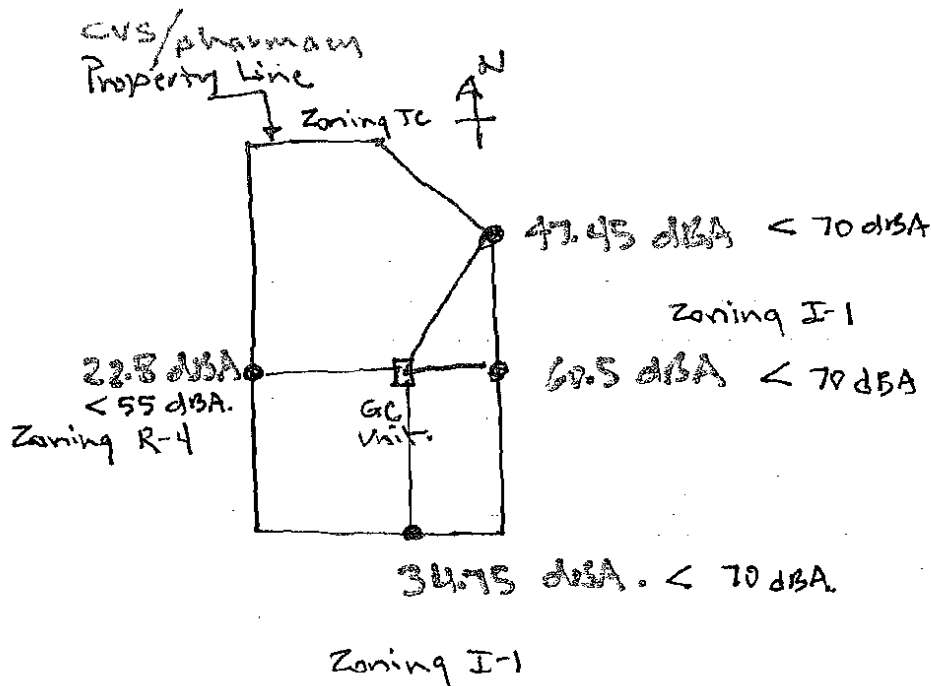
There are two building walls between chiller unit and the property line. Reading reduces by 10 dBA for each wall.

$$\begin{aligned}
&= 68 - 10 \times 2 - \left( \frac{504}{100} \right) \times 5 \\
&= 68 - 20 - 25.2 \\
&= 22.8 \text{ dBA.}
\end{aligned}$$

NOTE:

Based on the computations for noise level the noise level reduces as distance increases from the GC-1 unit.

Additional noise reduction (60 dBA) due to the walls around the GC-Unit.



**PARCEL DESCRIPTION OF CVS WAREHOUSE SITE**

A parcel of land being part of the N. E. 1/4 of Section 22, T. 1 N., R. 8 E., City of Novi, Oakland County, Michigan, and described as follows:

Commencing at the E. 1/4 corner of Section 22, T. 1 N., R. 8 E., City of Novi, Oakland County, Michigan; thence N 00° 23' 56" E 593.76 feet along the East line of Section 22; thence S 89° 56' 56" W 697.00 feet to the point of beginning and proceeding thence S 89° 56' 56" W 652.64 feet; thence N 00° 12' 00" E 303.65 feet; thence N 00° 05' 30" W 200.00 feet; thence N 00° 39' 03" E 260.21 feet; thence N 01° 40' 14" E 320.04 feet; thence N 00° 18' 20" E 379.59 feet; thence N 00° 05' 25" W 471.91 feet (calculated and measured) 476.68 feet (described) to a point on the south line of the Chesapeake and Ohio Railroad Right-of-Way; thence S 36° 09' 45" E 1094.32 feet (calculated and measured) along said Right-of-Way line; thence S 00° 23' 56" W 1051.55 feet to the point of beginning. Contains 22.3150 acres and is subject to easements and restrictions of record.

Parcel No. 50-22-22-276-006

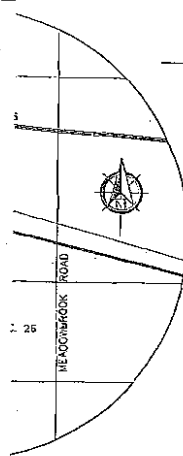
**PARCEL DESCRIPTION OF CONSERVATION EASEMENT WETLAND RESERVE**

Commencing at a point being the Northwest corner of the above mention site being the South line of the CSX Railroad Right-of-Way and the Western property line; thence S 36° 09' 45" 310.0 feet; thence S 89° 53' 35" W 48.0 feet; thence S 00° 06' 25" E 150.0 feet; thence N 89° 53' 35" E 121.51 feet; thence N 00° 06' 25" W 48.94 feet; thence N 36° 09' 45" W 125 feet to the point of beginning. Containing .33 ± acres.

NOVI ROAD C/L

E 1/4 CORNER OF SECTION 22 T.1N., R.8E.

N 00°23'56" E 593.76'



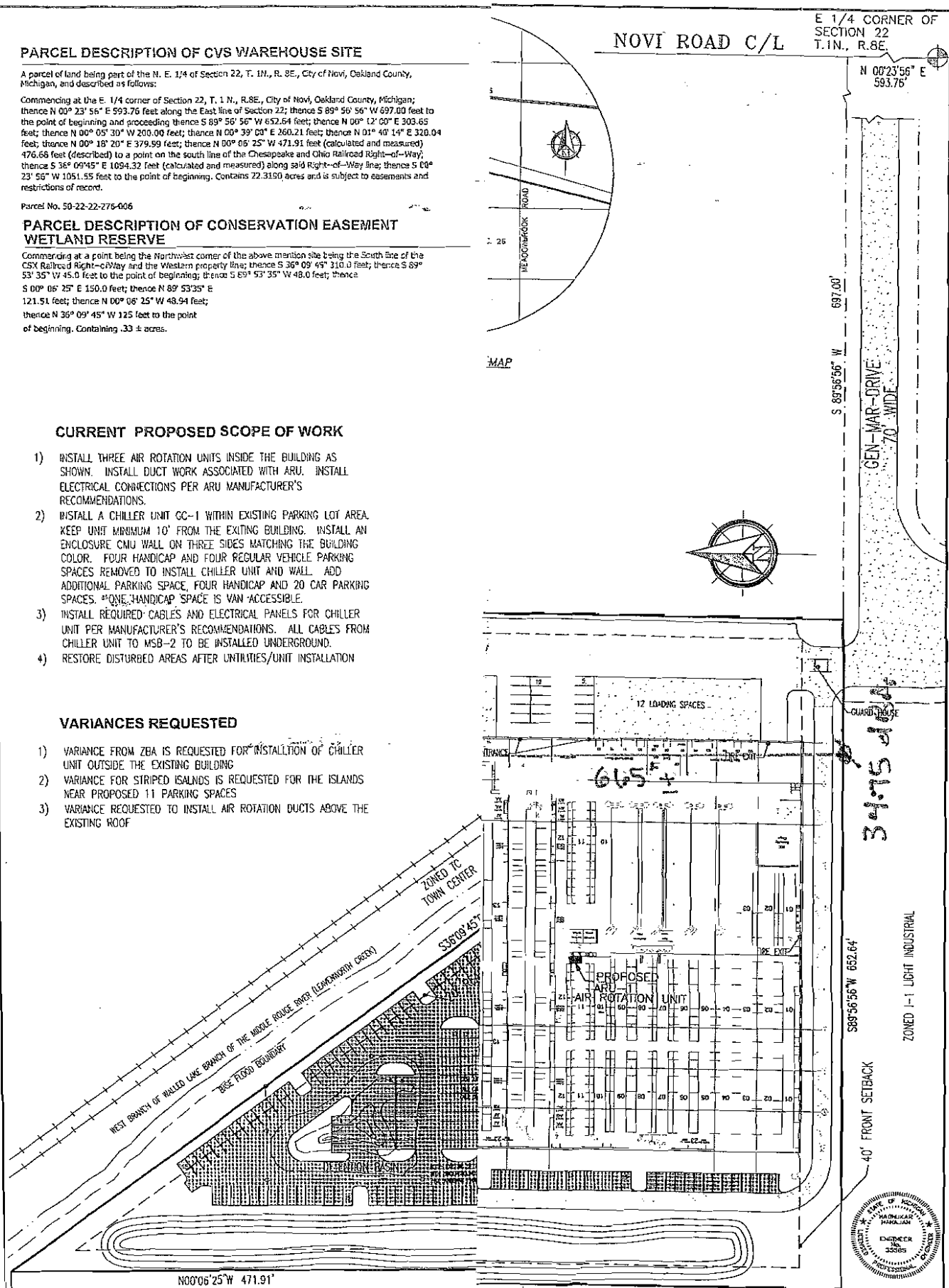
MAP

**CURRENT PROPOSED SCOPE OF WORK**

- 1) INSTALL THREE AIR ROTATION UNITS INSIDE THE BUILDING AS SHOWN. INSTALL DUCT WORK ASSOCIATED WITH ARU. INSTALL ELECTRICAL CONNECTIONS PER ARU MANUFACTURER'S RECOMMENDATIONS.
- 2) INSTALL A CHILLER UNIT GC-1 WITHIN EXISTING PARKING LOT AREA. KEEP UNIT MINIMUM 10' FROM THE EXISTING BUILDING. INSTALL AN ENCLOSURE CHU WALL ON THREE SIDES MATCHING THE BUILDING COLOR. FOUR HANDICAP AND FOUR REGULAR VEHICLE PARKING SPACES REMOVED TO INSTALL CHILLER UNIT AND WALL. ADD ADDITIONAL PARKING SPACE, FOUR HANDICAP AND 20 CAR PARKING SPACES. ONE HANDICAP SPACE IS VAN ACCESSIBLE.
- 3) INSTALL REQUIRED CABLES AND ELECTRICAL PANELS FOR CHILLER UNIT PER MANUFACTURER'S RECOMMENDATIONS. ALL CABLES FROM CHILLER UNIT TO MSB-2 TO BE INSTALLED UNDERGROUND.
- 4) RESTORE DISTURBED AREAS AFTER UTILITIES/UNIT INSTALLATION

**VARIANCES REQUESTED**

- 1) VARIANCE FROM ZBA IS REQUESTED FOR INSTALLATION OF CHILLER UNIT OUTSIDE THE EXISTING BUILDING
- 2) VARIANCE FOR STRIPED ISLANDS IS REQUESTED FOR THE ISLANDS NEAR PROPOSED 11 PARKING SPACES
- 3) VARIANCE REQUESTED TO INSTALL AIR ROTATION DUCTS ABOVE THE EXISTING ROOF



S 89°56'56" W 697.00'

GEN-MAR-DRIVE 70' WIDE

3475 d134

S89°56'56" W 652.64'

ZONED I-1 LIGHT INDUSTRIAL

40' FRONT SETBACK



|   |  |                       |  |                       |  |
|---|--|-----------------------|--|-----------------------|--|
| N00°06'25"W 471.91'   |  | N00°12'00"E 303.65'   |  | MARLSON AVE           |  |
| ZONED R-4 RESIDENTIAL   |  | ZONED R-4 RESIDENTIAL |  | ZONED R-4 RESIDENTIAL |  |
| PRELIMINARY, NOT FOR CONSTRUCTION   |  |                       |  |                       |  |
| NOTE: THE BACKGROUND INFORMATION SHOWN IS FROM JUNE 1996 APPROVED SITE PLAN |  |                       |  |                       |  |

| DATE      | ISSUE                    | BY | DATE | ISSUE |
|-----------|--------------------------|----|------|-------|
| 1/28/2010 | PER CITY REVIEW COMMENTS | LM |      |       |

REVISED SITE PLAN  
 CVS DISTRIBUTION CENTER  
 43800 GEM-MAR DRIVE  
 CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

SCALE 1" = 60'  
 SHEET C-3  
 FE09526

# Air-Cooled Series R(TM)

## Job Information

CVS - Novi  
 Jacksonville  
 (F70)Jim Van Etten



|                 |          |                      |                 |
|-----------------|----------|----------------------|-----------------|
| Taa             | 400 High | Unit nominal tonnage | 400             |
| Model number    | RTAC400  | Unit type            | High efficiency |
| Quantity        | 1        | Capacity             | 410.60 tons     |
| Product Version | 3.3      |                      |                 |

## Unit Information

|                         |           |                           |            |
|-------------------------|-----------|---------------------------|------------|
| Efficiency              | 10.1 EER  | Shipping weight           | 26913.0 lb |
| COP                     | 2.95 COP  | Length                    | 542.000 in |
| Ckt 1 Charge (HFC-134a) | 460.0 lb  | Width                     | 89.000 in  |
| Ckt 2 Charge (HFC-134a) | 460.0 lb  | Height                    | 96.000 in  |
| Manufacturing location  | Pueblo CO | A-weighted sound pressure | 78 dBA     |

## Evaporator Information

|                    |                        |                          |                            |
|--------------------|------------------------|--------------------------|----------------------------|
| Evap application   | Std temp with frz prot | Evap fouling factor      | 0.00010 hr-sq ft-deg F/Btu |
| Evap leaving temp  | 45.00 F                | Evap configuration       | 3 Pass                     |
| Evap entering temp | 63.00 F                | Evap fluid type          | Propylene glycol           |
| Evap flow rate     | 580.80 gpm             | Evap fluid concentration | 35.00 %                    |
| Evap pressure drop | 18.60 ft H2O           | Evap. fluid freeze point | 2.73 F                     |

## Condenser Information

|                  |         |                    |                    |
|------------------|---------|--------------------|--------------------|
| Ambient air temp | 95.00 F | Cond fin material  | Aluminum slit Fins |
| Elevation        | 0.00 ft | Cond ambient range | Standard Ambient   |

## Electrical Information

|                            |                  |                                |              |
|----------------------------|------------------|--------------------------------|--------------|
| Unit voltage               | 460V/60Hz/3Ph    | LRA - compressor A             | 285.00 A     |
| Unit power                 | 489.20 kW        | LRA - compressor B             | 285.00 A     |
| Compressor power           | 446.80 kW        | LRA - compressor C             | 285.00 A     |
| Fan motor power            | 40.70 kW         | LRA - compressor D             | 285.00 A     |
| Number of condenser fans   | 28.00 Each       | Incoming power line connection | Single point |
| Compressor starter type    | Wye-delta closed | Single point power MCA         | 767.00 A     |
| RLA - condenser fan (each) | 3.00 A           | Single point power MOP         | 800.00 A     |
| RLA - compressor A         | 162.00 A         | Dual point power MCA - ckt 1   |              |
| RLA - compressor B         | 162.00 A         | Dual point power MCA - ckt 2   |              |
| RLA - compressor C         | 162.00 A         | Dual point power MOP - ckt 1   |              |
| RLA - compressor D         | 162.00 A         | Dual point power MOP - ckt 2   |              |

This unit complies with the efficiency requirements of ASHRAE Standard 90.1 and CAN/CSA C743.

Performance for above conditions is rated in accordance with ARI Standard 550/590. The following are outside the scope of ARI Standard 550/590: Glycol, 50 Hz, Size RTAC 200-500 and remote evaporator

# Air-Cooled Series R(TM)

## Job Information

CVS - Novi  
 Jacksonville  
 (F70)Jim Van Etten



|                 |          |                      |                 |
|-----------------|----------|----------------------|-----------------|
| Taa             | 400 High | Unit nominal tonnage | 400             |
| Model number    | RTAC400  | Unit type            | High efficiency |
| Quantity        | 1        | Capacity             | 410.60 tons     |
| Product Version | 3.3      |                      |                 |

## Information for LEED Projects

|                            |             |                  |           |
|----------------------------|-------------|------------------|-----------|
| ASHRAE 90.1/CSA compliance | ASHRAE      | Efficiency       | .10.1 EER |
| Ckt 1 Charge (HFC-134a)    | 460.0 lb    | IPLV             | 14.7 EER  |
| Ckt 2 Charge (HFC-134a)    | 460.0 lb    | Compressor power | 446.80 kW |
| Rated capacity (ARI)       | 420.80 tons | Fan motor power  | 40.70 kW  |

Note: This product meets the minimum equipment efficiency requirements of ASHRAE Standard 90.1-2004 and 2007 (which are based on ARI standard rating conditions) and, therefore, also meets the LEED "Minimum Energy Performance" prerequisite in the Energy and Atmosphere section. The efficiencies and power data listed above are at actual user-

The LEED Green Building Rating System™, developed by the U.S. Green Building Council, provides independent, third-party verification that a building project meets green building and performance measures.

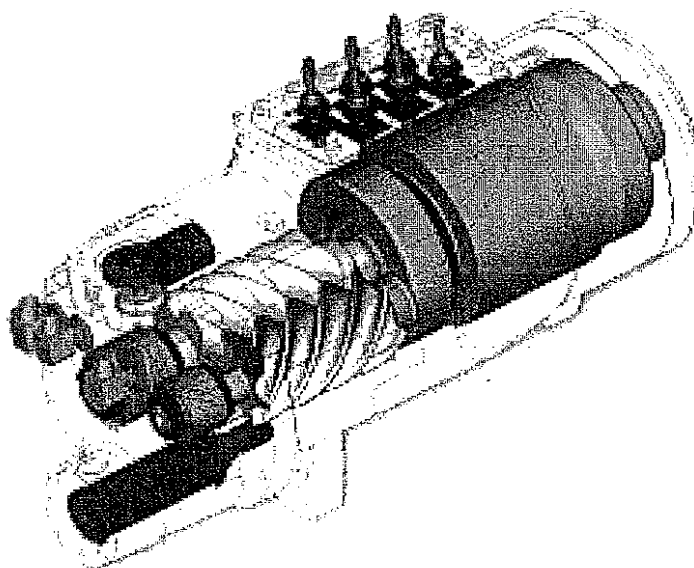
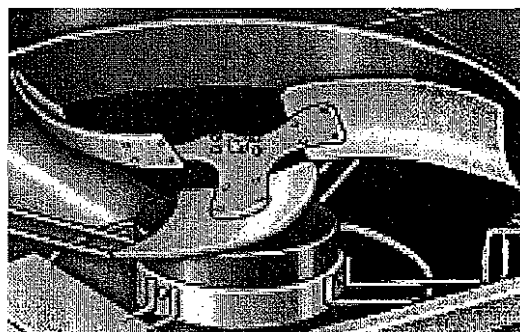


# Engineering Bulletin

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## Sound Data and Application Guide For the New and Quieter Air-Cooled Series R™ Chiller

Model RTAC  
140-500 Tons (60 Hz)  
140-400 Tons (50 Hz)





## Introduction

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### **The New, Quieter Air Cooled Series R™ Chiller – Model RTAC**

The sound levels of the air-cooled Series R™ Model RTAA chillers have been steadily improved since their introduction in 1990. With the advent of the Model RTAC, sound levels are reduced significantly by addressing three major sources: the compressor, the refrigerant piping, and the condenser fans.

The compressor has been designed to minimize sound at its point of creation. This was accomplished by conducting finite element analysis on the compressor housing to find areas that would amplify the frequencies generated from compression. These areas were then redesigned to reduce sound transmission.

The refrigerant components and piping have been optimized to reduce vibration and sound propagation throughout the system.

Another source of sound originates from the condenser fans. Fan sound power can be as much as half of the overall unit sound power levels. Careful consideration was taken when designing and selecting the next generation condenser fans to be engineered into the Model RTAC. The sound levels achieved on the Model RTAC represent the lowest sound levels ever on Trane air-cooled screw compressor water chillers.

When installing any chiller, forethought should be given to the chiller and its relationship with the structure. Issues such as sound and vibration should be considered and factored into the building design and chiller location within a given structure. These issues are not unique to chillers but should be considered when any mechanical device is located in or on a structure.

This bulletin is not intended to be a replacement for a sound consultant, but rather a tool for you to advise owners, engineers and contractors of useful tips when designing and installing chiller installations. This engineering bulletin provides guidelines for addressing both unit location and airborne sound when installing air-cooled Series R™ chillers.

# Contents

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| Ground Level Equipment | 4  |
| Roof-Mounted Equipment | 4  |
| Airborne Noise         | 7  |
| Sound Levels           | 8  |
| Appendix A             | 16 |
| Appendix B             | 18 |





# Unit Location

Outdoor HVAC equipment must be located to minimize noise and vibration transmission to the occupied spaces of the building structure it serves. Also, the equipment must be located to prevent objectionable noise levels at adjacent property lines or building structures. When choosing a location for the equipment, consider the following application material for both ground level and roof mounted equipment.

An additional concern for the designer is the resulting noise level at adjacent property lines. When commercial size equipment is installed near a residential lot line, there is potential for a sound problem. In this situation, the problem is not the commercial equipment but rather locating the equipment too close to a quiet zone! For equipment operating adjacent to residential areas, zone ordinances require maximum lot line dBA levels of 50-55/45 (day/night). In commercial areas 60-65/55-60 (day/night). In industrial areas typical levels mandated by local code authorities are 65-70/65-70 (day/night). The reader is cautioned that the foregoing values listed are those typically seen across major cities of the U.S. The requirements vary by locality so **the designer is cautioned to always check the criteria and local requirements before selecting equipment locations**

## A. Ground Level Equipment

1. If the equipment must be located in close proximity to a building, it should be placed next to an unoccupied space such as a storage room, mechanical room, switch gear/electrical room or other typically unoccupied space. It is not recommended to locate the equipment near occupied, sound sensitive areas of the building or near windows. Also, do not locate the equipment adjacent to other building walls or large objects which may reflect the sound back to the sound sensitive receiver.

2. Seal all piping and electrical conduit penetrations in the building envelope with an approved fire safe sealant. Utilize insulated, dielectrically compatible sleeves at wall penetrations to properly support the piping and provide vibration damping. Provide flexible couplings and vibration isolators for the water circulating pump and connections to prevent the transmission of sound throughout the building.
3. Install the unit on a pad isolated from the building or install the unit with proper vibration isolation underneath the unit to prevent machine vibrations from being transmitted to the structure of the building.

## B. Roof Mounted Equipment

### 1. Roof Location

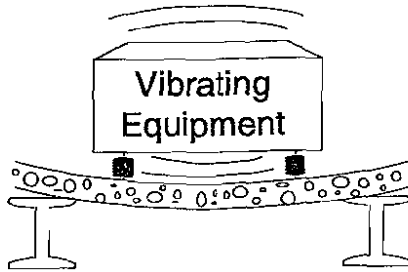
- The single most effective recommendation to prevent sound problems within a building is to locate the unit over non-critical areas such as copy rooms, restrooms, storage rooms, and other similar non-occupied areas of the building. It is not recommended to locate a unit directly over or in close proximity to sound sensitive areas such as conference rooms, executive office spaces, libraries, etc.
- It is not recommended to locate the equipment near occupied, sound sensitive areas of the building or near window glass. Also, do not locate the equipment adjacent to other building walls or large objects which may reflect the sound back to the sound sensitive receiver.

### 2. Building Structure

- When mounting the chiller on the roofline, it is not recommended to locate the unit on a beam or structure at mid-span of the column grid. Rather, directly support the unit over columns. Nor is it recommended to locate the unit in the middle of a horizontal beam. Try to avoid large column spans. This will minimize the roof deflection vibration transmission.
- When directly mounting chillers on I-beams that are above the roofline and mounted to the building support columns, there exists the potential for a resonant frequency at which higher than normal vibration may be transmitted to the rest of the building. Be cognizant of this application. A consultant may be required for evaluation.

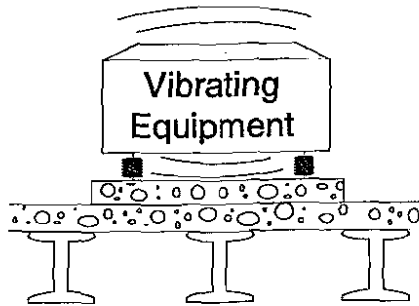
# Unit Location

## Building Support



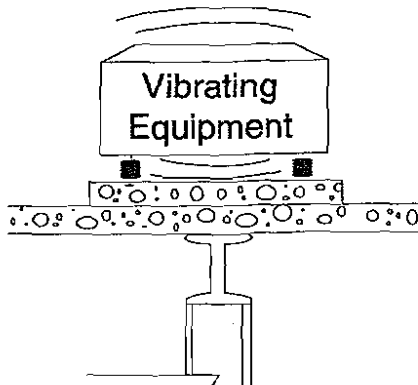
### Poor

Concentration of equipment weight between beams causes excessive roof deflection and vibration transmission, even for isolated equipment.



### Good

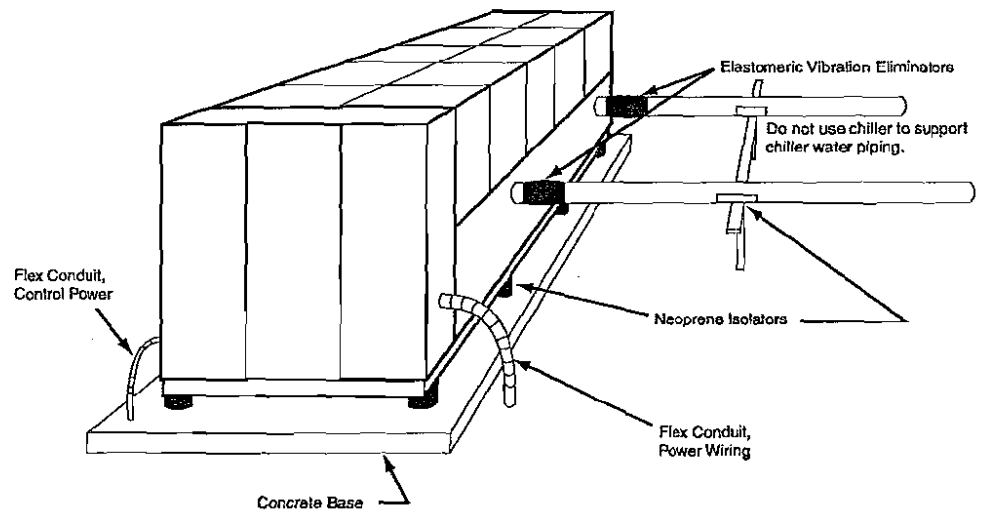
Further addition of housekeeping pad and additional beams add mass and stiffness to roof.



### Very Good

A column directly under the equipment gives the roof a very high local stiffness, but some equipment vibration still enters the roof slab.

When directly mounting chillers on I-beams (at the roofline) that are mounted to the building, support columns potentially can transmit higher than normal vibration at a resonant frequency to the rest of the building. The following drawing depicts what type of prevention methods can be taken.



### 3. Base

- It is not recommended to bolt down vibrating equipment directly to foundation without using isolators.
- Install the unit upon an inertia base or concrete pad structure with vibration isolation to match the characteristics of the roof structure. Beware of lightweight roof structures which are difficult to isolate from vibration.
- Use an inertia base or solid concrete pad as a base for the chiller. This mass, properly supported, will maximize vibration dampening and help prevent noise from penetrating through the roof directly below the unit. Floors and ceiling should be concrete slabs.

### 4. Isolators

- Isolate chiller on ELASTOMERIC isolators. Originally intended for reciprocating compressors, spring isolators are not as effective at absorbing movement and vibration on air-cooled Series R chiller installations. This is because air-cooled Series R chillers have higher frequency vibration (900 Hz) than reciprocating chillers (less than 125 Hz).
- Isolate the unit on elastomeric isolators selected to match the characteristics of the roof structure. It is not

recommended that equipment be applied to buildings with a lightweight roof structure unless column supports are provided which are independent of the roof structure.

### 5. Chilled Water Piping

- Provide flexible couplings and vibration isolators for the water circulating pump connections to prevent the transmission of sound throughout the building.
- Isolate chilled water piping from the chiller with ELASTOMERIC vibration eliminators. Metal braided eliminators have proven to be much less effective than elastomeric isolators in reducing vibration transmission to the building through the piping.
- Isolate pipe hangers with ELASTOMERIC isolators. This reduces vibration transmission to the building. Do not let the chiller support the weight of the chilled water piping. Isolating pipe hangers this way reduces vibration transmission to the building.

### 6. Electrical

- Electrical connections to the chiller should be in flex conduit. Hard electrical conduit is another vibration path that should be eliminated in chiller installations.

# Unit Location

## 7. Sealing Penetrations

- Seal all piping and electrical conduit penetrations in the building envelope with an approved fire safe sealant. Utilize insulated, dielectrically compatible sleeves at wall penetrations to properly support the piping and provide vibration damping.
- Acoustically treat all wall penetrations (piping, conduit, duct, outdoor vents, etc.)

### Sound Pressure

Table 1 gives the overall A-weighted sound pressure levels for the air-cooled Series R™ chiller. Information given in this bulletin along with the data in Table 1 may be used to estimate the sound pressure levels of common installations. Estimations made using this bulletin are considered typical of what may be measured in a free field with a hand-held sound meter, in the absence of a nearby reflective surface.

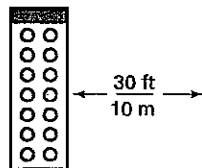
**Table 1 — Sound Pressure Levels Series R™ Air-Cooled Chiller**

| Unit Size<br>RTAC | A-Weighted Sound Pressure Level, dBA, ref 20 micro Pa |              |
|-------------------|---|--------------|
|                   | 60 Hz @ 30 ft   | 50 Hz @ 10 m |
| 140 STD           | 72.0  | 68.0         |
| 155 STD           | 73.0  | 69.0         |
| 170 STD           | 74.0  | 69.0         |
| 185 STD           | 74.0  | 70.0         |
| 200 STD           | 75.0  | 71.0         |
| 225 STD           | 75.0  | NA           |
| 250 STD           | 75.0  | 71.0         |
| 275 STD           | 76.0  | 72.0         |
| 300 STD           | 76.0  | 73.0         |
| 350 STD           | 77.0  | 72.0         |
| 375 STD           | NA  | 73.0         |
| 400 STD           | 78.0  | 74.0         |
| 450 STD           | 78.0  | NA           |
| 500 STD           | 78.0  | NA           |
| 140 HIGH          | 73.0  | 69.0         |
| 155 HIGH          | 74.0  | 69.0         |
| 170 HIGH          | 74.0  | 70.0         |
| 185 HIGH          | 75.0  | 71.0         |
| 200 HIGH          | 75.0  | 71.0         |
| 225 HIGH          | 75.0  | NA           |
| 250 HIGH          | 75.0  | 71.0         |
| 275 HIGH          | 76.0  | 72.0         |
| 300 HIGH          | 77.0  | 73.0         |
| 350 HIGH          | 77.0  | 73.0         |
| 375 HIGH          | NA  | 74.0         |
| 400 HIGH          | 78.0  | 74.0         |

Note: 30 ft or 10 m is measured from the side of the chiller. Sound radiation at this distance will approximate a line noise source.

Sound power octave band data are given in Appendix 1. Acoustical consultants may require the data in Appendix 1 to perform a detailed acoustical analysis. Acoustical analysis may also be done using the Trane Acoustics Program (C.D.S.).

Note: The sound power data in Appendix 1 cannot be compared directly to SOUND PRESSURE data given in Table 1 above.



Sound measurements taken closer than 30 ft/10 m may be greatly distorted due to the large chiller lengths and multiple noise sources within the chiller.

# Unit Location

## Noise Control of Air-Cooled Series R™ Chillers

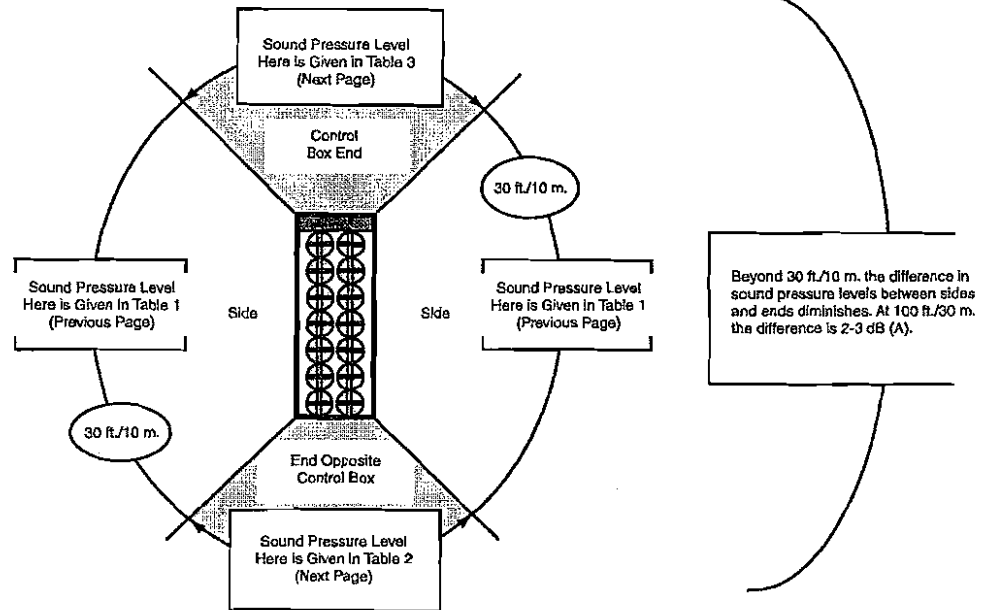
Three techniques are available for taking full advantage of the sound properties of the air-cooled Series R™ chiller and minimizing the potential for noise problems. These are:

- Unit orientation
- Distance factor
- Sound attenuation through use of barrier walls

### Unit Orientation

The air-cooled Series R™ chillers sound is directional in nature, allowing the contractor/engineer to position the unit to minimize potential noise problems. The chiller may be oriented such that the control box end or end opposite the control box faces the direction where a noise problem is expected; refer to Figure 1.

Figure 1 – Orientation of the Chiller to Minimize Noise Problems





# Unit Location

**Table 2 — Sound Pressure Levels End Opposite Control Box**

| Unit Size<br>RTAC | A-Weighted Sound Pressure Level, dBA, ref 20 micro Pa |              |
|-------------------|---|--------------|
|                   | 60 Hz @ 30 ft   | 50 Hz @ 10 m |
| 140 STD           | 68.0  | 64.0         |
| 155 STD           | 69.0  | 65.0         |
| 170 STD           | 70.0  | 65.0         |
| 185 STD           | 70.0  | 66.0         |
| 200 STD           | 71.0  | 67.0         |
| 225 STD           | 71.0  | NA           |
| 250 STD           | 71.0  | 67.0         |
| 275 STD           | 72.0  | 68.0         |
| 300 STD           | 72.0  | 69.0         |
| 350 STD           | 73.0  | 68.0         |
| 375 STD           | NA  | 69.0         |
| 400 STD           | 74.0  | 70.0         |
| 450 STD           | 74.0  | NA           |
| 500 STD           | 74.0  | NA           |
| 140 HIGH          | 69.0  | 65.0         |
| 155 HIGH          | 70.0  | 65.0         |
| 170 HIGH          | 70.0  | 66.0         |
| 185 HIGH          | 71.0  | 67.0         |
| 200 HIGH          | 71.0  | 67.0         |
| 225 HIGH          | 71.0  | NA           |
| 250 HIGH          | 71.0  | 67.0         |
| 275 HIGH          | 72.0  | 68.0         |
| 300 HIGH          | 73.0  | 69.0         |
| 350 HIGH          | 73.0  | 69.0         |
| 375 HIGH          | NA  | 70.0         |
| 400 HIGH          | 74.0  | 70.0         |

**Table 3 — Sound Pressure Levels Control Box End**

| Unit Size<br>RTAC | A-Weighted Sound Pressure Level, dBA, ref 20 micro Pa |              |
|-------------------|---|--------------|
|                   | 60 Hz @ 30 ft   | 50 Hz @ 10 m |
| 140 STD           | 67.0  | 63.0         |
| 155 STD           | 68.0  | 64.0         |
| 170 STD           | 69.0  | 64.0         |
| 185 STD           | 69.0  | 65.0         |
| 200 STD           | 70.0  | 66.0         |
| 225 STD           | 70.0  | NA           |
| 250 STD           | 70.0  | 66.0         |
| 275 STD           | 71.0  | 67.0         |
| 300 STD           | 71.0  | 68.0         |
| 350 STD           | 72.0  | 67.0         |
| 375 STD           | NA  | 68.0         |
| 400 STD           | 73.0  | 69.0         |
| 450 STD           | 73.0  | NA           |
| 500 STD           | 73.0  | NA           |
| 140 HIGH          | 68.0  | 64.0         |
| 155 HIGH          | 69.0  | 64.0         |
| 170 HIGH          | 69.0  | 65.0         |
| 185 HIGH          | 70.0  | 66.0         |
| 200 HIGH          | 70.0  | 66.0         |
| 225 HIGH          | 70.0  | NA           |
| 250 HIGH          | 70.0  | 66.0         |
| 275 HIGH          | 71.0  | 67.0         |
| 300 HIGH          | 72.0  | 68.0         |
| 350 HIGH          | 72.0  | 68.0         |
| 375 HIGH          | NA  | 69.0         |
| 400 HIGH          | 73.0  | 69.0         |



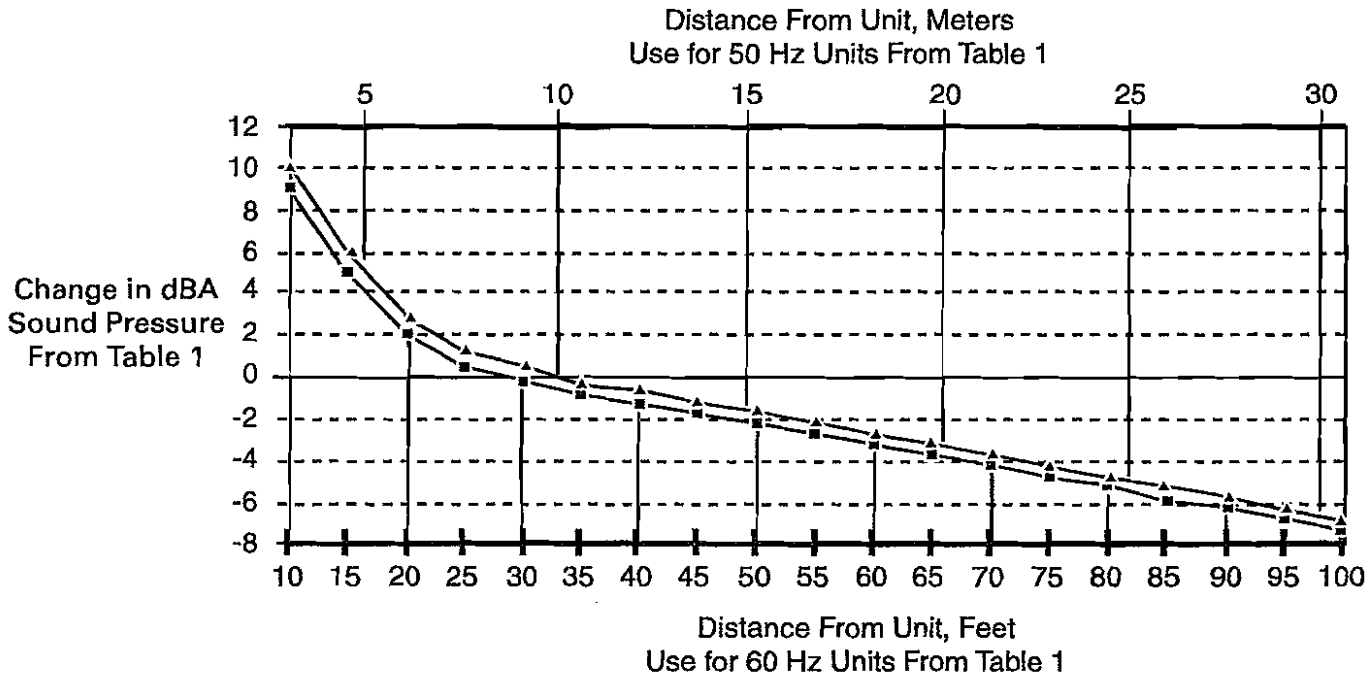
# Unit Location

## Distance Factor

The distance between a source of sound and the receiver or place of sound measurement plays an important part in minimizing potential noise problems. Figure 2 gives the reductions in sound pressure level, dBA based on increasing distance from the chiller. Sound levels at a specific location can be minimized by correctly orienting the chiller (see Figure 1) and placing the chiller as far away from the location as possible (see Figure 2).

Figure 2 - Sound Attenuation Due to Distance

Note: Top Curve and Axis for 50 Hz Units  
Bottom Curve and Axis for 60 Hz Units



Note: Sound measurements taken closer than 30 ft/10 m may be greatly distorted when compared to an estimation made using Table 1 and Figure 2 due to large chiller lengths and multiple noise sources within the chiller.

Note: Beyond 100 ft or 30 meters, the sound pressure will continue to decrease 5 dBA for each doubling of the distance from the unit to the place of measurement. For example, the sound pressure at 200 ft will be 5 dBA lower than the sound pressure at 100 ft.

# Unit Location

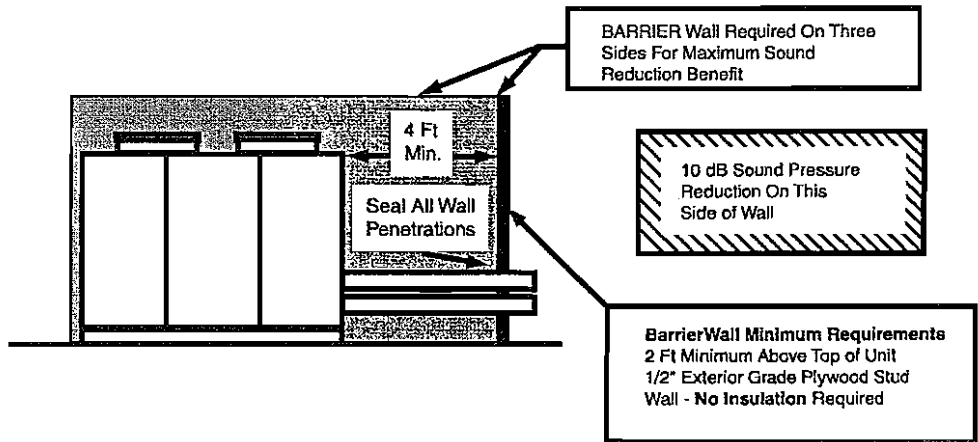
**Sound Attenuation Using Barrier Walls**  
 Reciprocating chillers are characterized by a low frequency pounding sound that is typically difficult to attenuate. The direct drive Series R™ compressor and condenser fans have a medium and high frequency characteristic that may be attenuated with simple, inexpensive barrier walls.

A barrier wall constructed to only 1/2 inch exterior grade plywood gives a dramatic 10 dBA reduction in sound. Refer to Figure 3 for minimum wall requirements. Solid walls of brick or other more robust outdoor materials are equally acceptable and can be expected to give better attenuation. Masonry block walls with special sound absorbing cavities should be considered for critical applications.

A minimum distance of 4 ft is recommended, but the chiller may be placed closer than 4 ft to a barrier wall. Some loss of performance will occur. Refer to Trane engineering bulletin RLC-PRB004-EN.

Louvered panels or decorative walls with any amount of open area should not be used to attenuate sound. They have little or no sound reflecting or attenuating benefit. Also, an insulated sheet metal box covering the compressors alone will provide minimal sound attenuation and is not recommended.

Figure 3 -- Suggested Barrier Wall for Sound Attenuation



# Unit Location

## An Example

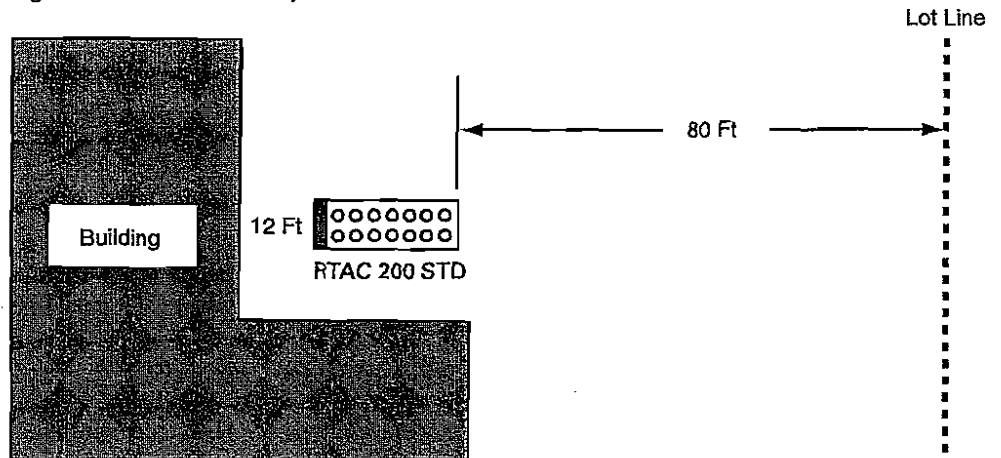
An example will demonstrate how to use the preceding information to minimize potential problems for noise sensitive installations. For purposes of this example, assume that the installation is represented by Figure 4. The objective is to design an installation that will yield 65 dBA or less at the lot line.

The estimation of sound pressure at the lot line is made as follows:

- 75 dBA - from Table 1, sound pressure @ 30 ft for RTAC 200 STD @ 60 Hz
- 4 dBA - Deduct 4 dBA because of chiller orientation from Figure 1, @ 80 ft
- 5 dBA - Deduct 5 dBA due to distance factor from Figure 2, @ 80 ft
- +3 dBA - Addition of 3 dBA due to sound reflection of building wall 12 ft from chiller<sup>1</sup>
- 69 dBA - Estimated Sound Pressure at the lot line (with no barrier wall)
- 69 dBA exceeds the requirement of 65 dBA at the lot line. An acoustical barrier wall as shown in Figure 3 will reduce the sound pressure an additional 10 dBA, to 59 dBA, thus meeting the requirement.
- 69 dBA - Estimated sound power at the lot line with no barrier wall
- 10 dBA - Reduction due to acoustical barrier wall
- 59 dBA - Estimated Sound Pressure at the lot line with a barrier wall.

<sup>1</sup>Note that a building wall in close proximity to the unit, 15 ft or less, reflects the sound towards the lot line. In effect this causes the building to act like a second sound source raising the measured sound at the lot line by as much as 3 dBA.

Figure 4 - Installation Example



**Building Upper Story Sound Problems**  
Air-cooled chillers are sometimes installed adjacent to and below the occupied space of larger buildings, where the noise sensitivity of the upper stories of the building may be a concern. Once again, use of an acoustical barrier wall can be very effective. Refer to Figure 5.

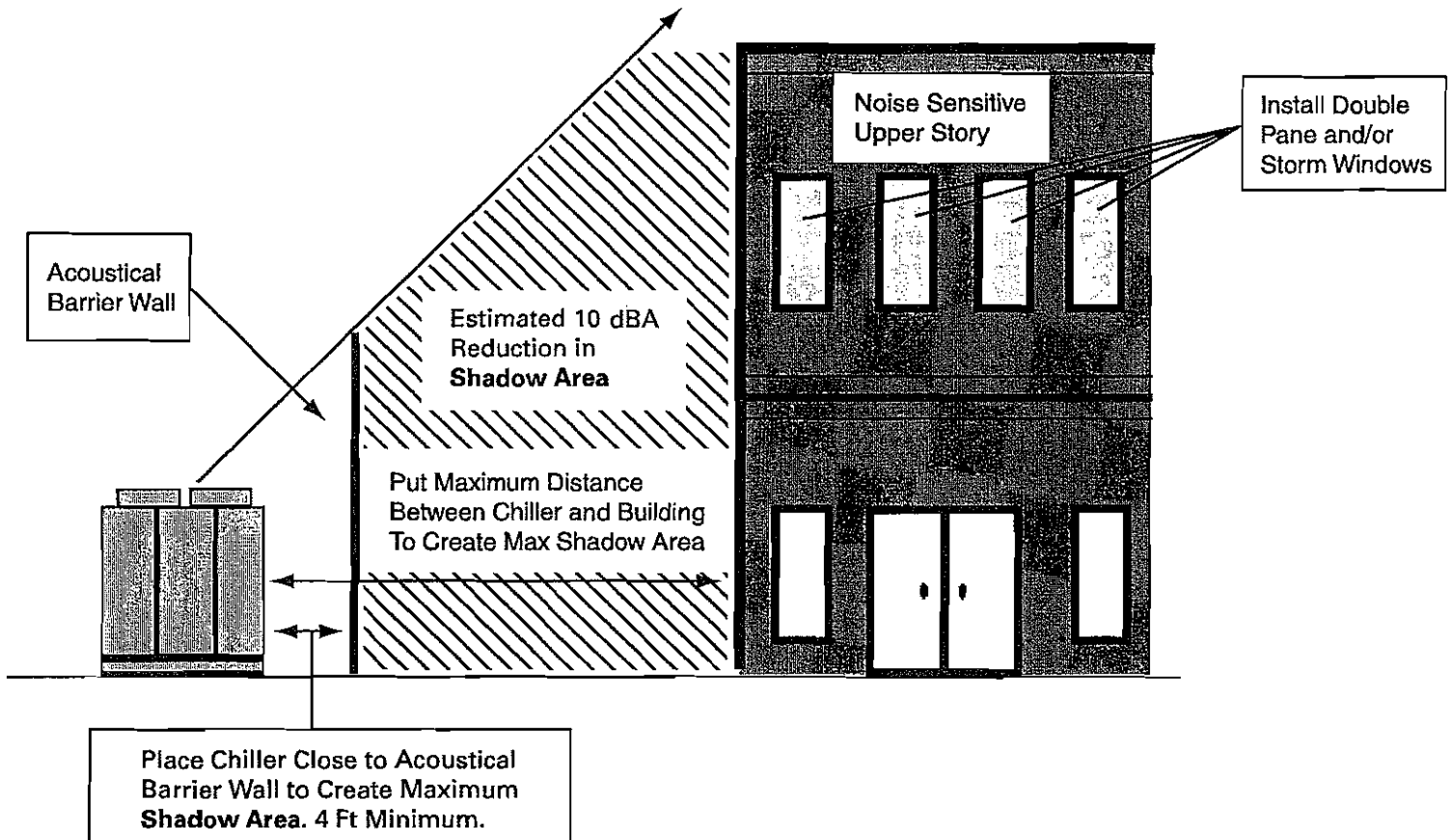
The acoustical barrier wall placed as shown in Figure 5 attenuates both compressor and fan noise and will yield an estimated 10 dBA sound pressure reduction in the "shadow" area created by the wall. In order to create the largest possible "shadow" area, the acoustical barrier wall should be as tall as possible, with the unit placed as close as possible

to the barrier wall and the unit placed as far from the building as possible. The unit should be located a minimum of 15 ft from the building to minimize the potential for reflected sound. Also seal any electrical or water assemblies that penetrate the barrier wall to avoid "sound leaks" towards the building. Refer to Figure 3 for minimum construction requirements of barrier walls.



# Unit Location

Figure 5 – Use of Attenuation for Upper Story Building Sound Problems



### Acoustical Fan Discharge Stacks

Use of acoustical fan discharge stacks by themselves will produce only marginal sound attenuating benefits. It is important to remember that both the compressors and the fans contribute to the sound of the air-cooled Series R™ chiller. Compressor noise is not attenuated by a fan discharge stack and a locally built and installed acoustical "box" around the compressors is not an effective means of compressor sound attenuation.

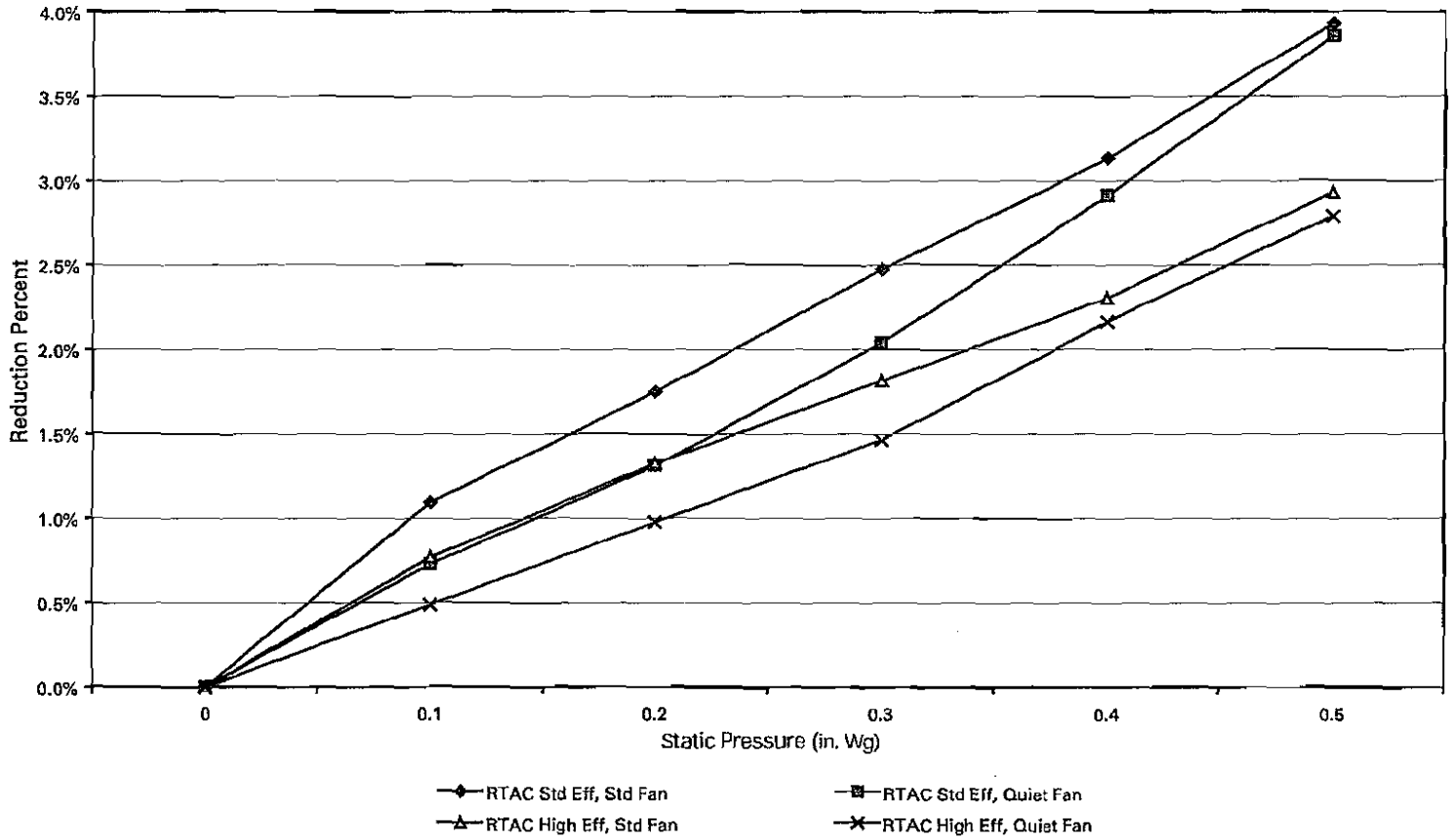
However, acoustical fan discharge stacks can be used with an acoustical barrier wall. Selection and installation of acoustical fan discharge stacks must be done by a competent acoustical engineer in order to be effective.

Please note that chiller performance is adversely affected by the use of acoustical fan discharge stacks. Refer to Figures 6 through 8. The length and open area of acoustical fan discharge stacks must be designed to produce no more than 0.5 inch of additional static pressure on the condenser fans. Also note that care must be taken to properly support discharge fan stacks against severe cross winds.

# Unit Location

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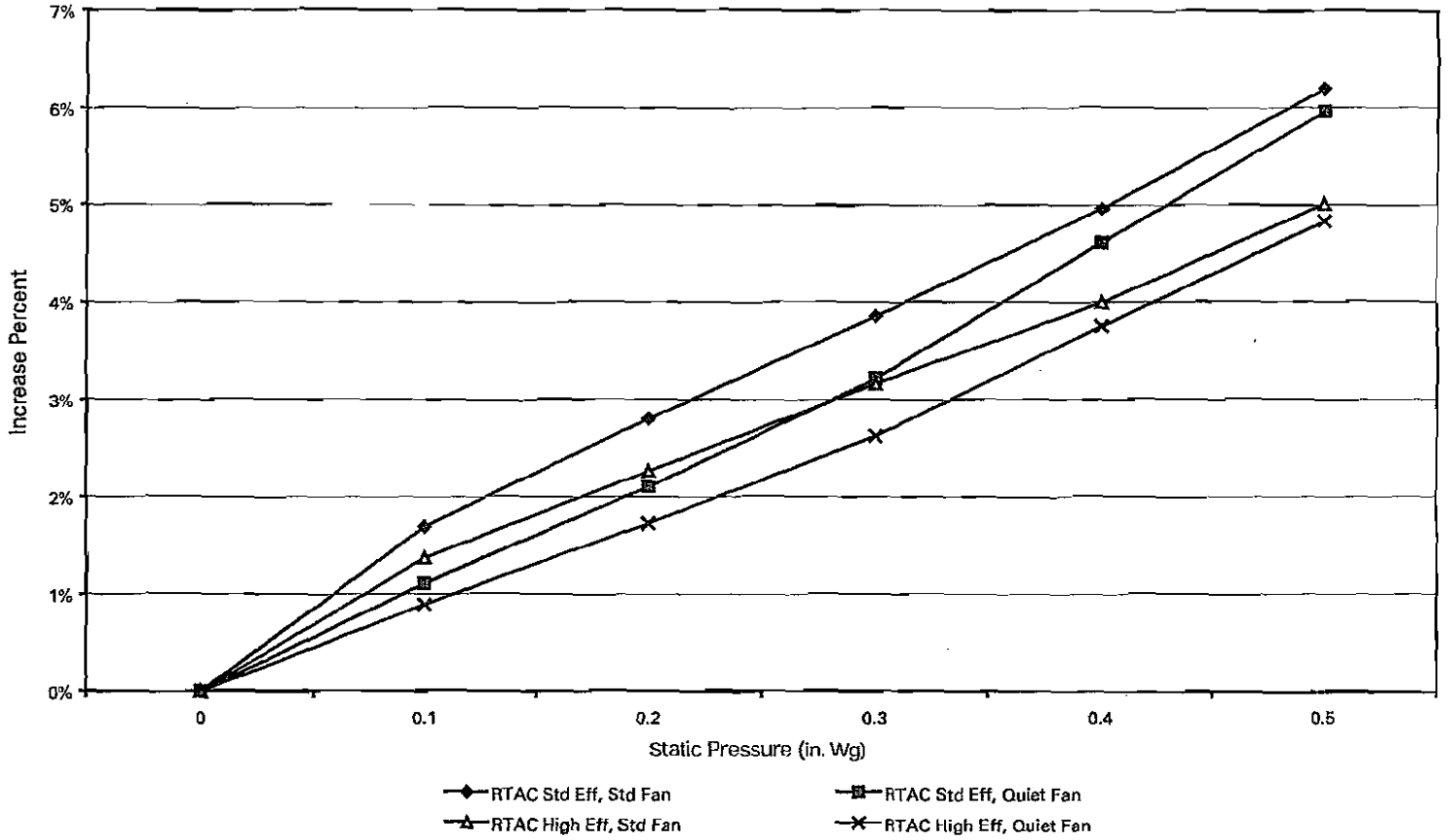
Figure 6 – Static Pressure Capacity Reduction





# Unit Location

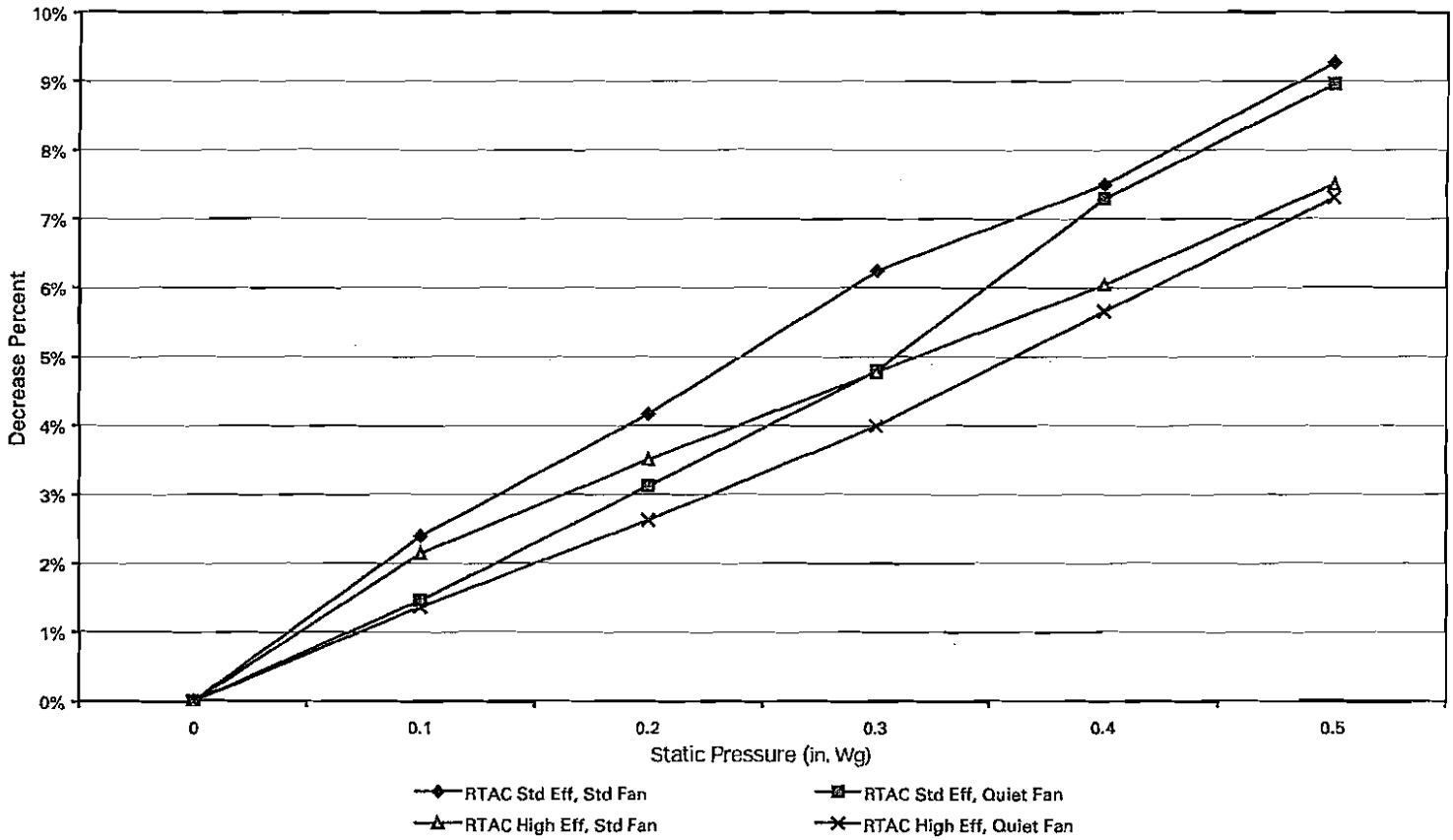
Figure 7 - Static Pressure kW Increase





# Unit Location

Figure 8 - Static Pressure EER Decrease





# Appendix A

## Appendix A

### Sound Power Octave Band Data

Sound power octave band data can be used for purposes of describing the basic acoustical properties of the air-cooled Series R™ chiller. However, there are two cautionary notes. First, if the engineer is using the data as a criteria in a bid evaluation, make sure that the data from all competitors is on an equal basis. Insist that all competitors present data terms of **SOUND POWER (not sound pressure)**, in a consistent format, according to **ARI Standard 370**.

>>>Sound power data CANNOT be compared directly to sound pressure data. <<<

Second, the sound power data does not provide sufficient information to correctly position the chiller or attenuate its sound to take full advantage of the characteristics of the air-cooled Series R chiller. Unlike most reciprocating chillers that exhibit a low frequency, pounding sound, the air-cooled Series R chiller sound is directional in nature and has a higher frequency characteristic that is more easily attenuated. The specific application information given in the preceding parts of this bulletin can be used to create a significant competitive advantage over competitive air-cooled reciprocating chillers.

NOTE: Sound Power Rating data given in Tables A-1 through A-2 may vary  $\pm 2$  dB in any specific octave band due to normal variations in chiller construction.

**Table A-1 (60 Hz) – Octave Band Sound Power Levels, dB ref, 1 pw**

| Model RTAC | Octave Band & Center Frequency, Hz |     |     |     |      |      |      |      | Overall A' Wtd |
|------------|------------------------------------|-----|-----|-----|------|------|------|------|----------------|
|            | 63                                 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |                |
| 140 STD    | 101                                | 102 | 98  | 97  | 96   | 91   | 86   | 83   | 100            |
| 155 STD    | 102                                | 102 | 98  | 98  | 97   | 93   | 86   | 83   | 101            |
| 170 STD    | 102                                | 103 | 99  | 99  | 98   | 94   | 87   | 84   | 102            |
| 185 STD    | 102                                | 103 | 99  | 100 | 98   | 93   | 87   | 84   | 102            |
| 200 STD    | 103                                | 104 | 100 | 101 | 98   | 93   | 88   | 85   | 103            |
| 225 STD    | 103                                | 104 | 100 | 101 | 98   | 93   | 88   | 85   | 103            |
| 250 STD    | 104                                | 104 | 101 | 101 | 98   | 94   | 88   | 85   | 103            |
| 275 STD    | 104                                | 105 | 101 | 101 | 100  | 95   | 89   | 86   | 104            |
| 300 STD    | 105                                | 105 | 101 | 102 | 100  | 95   | 90   | 87   | 104            |
| 350 STD    | 105                                | 106 | 102 | 103 | 100  | 95   | 90   | 87   | 105            |
| 400 STD    | 106                                | 107 | 103 | 104 | 101  | 96   | 91   | 88   | 106            |
| 450 STD    | 106                                | 107 | 103 | 104 | 101  | 96   | 91   | 88   | 106            |
| 500 STD    | 107                                | 107 | 104 | 104 | 101  | 97   | 91   | 88   | 106            |
| 140 HIGH   | 102                                | 103 | 99  | 98  | 97   | 92   | 87   | 84   | 101            |
| 155 HIGH   | 102                                | 103 | 99  | 99  | 97   | 93   | 87   | 84   | 102            |
| 170 HIGH   | 103                                | 104 | 99  | 100 | 98   | 94   | 87   | 85   | 102            |
| 185 HIGH   | 103                                | 104 | 100 | 100 | 98   | 94   | 88   | 85   | 103            |
| 200 HIGH   | 104                                | 104 | 100 | 101 | 98   | 93   | 88   | 86   | 103            |
| 225 HIGH   | 104                                | 104 | 100 | 101 | 98   | 94   | 88   | 85   | 103            |
| 250 HIGH   | 104                                | 105 | 101 | 102 | 99   | 94   | 88   | 86   | 103            |
| 275 HIGH   | 105                                | 105 | 101 | 102 | 100  | 96   | 89   | 86   | 104            |
| 300 HIGH   | 105                                | 106 | 102 | 103 | 100  | 95   | 90   | 87   | 105            |
| 350 HIGH   | 106                                | 107 | 102 | 103 | 101  | 97   | 90   | 88   | 105            |
| 400 HIGH   | 107                                | 107 | 103 | 104 | 102  | 96   | 91   | 89   | 106            |

Sound Power is a calculated quantity and cannot be measured directly like SOUND PRESSURE. Sound power is the amount of acoustical power produced at the source, and thus is an absolute quantity and not dependent on the surrounding environment or distance, as is sound pressure. 32 measurements are taken over a prescribed area around the unit. Data is then mathematically reduced to give the sound power level, dB.

# Appendix A

**Table A-2 (50 Hz) – Octave Band Sound Power Levels, dB ref, 1 pw**

| Model RTAC | Octave Band & Center Frequency, Hz |     |     |     |      |      |      |      | Overall<br>A' Wtd |
|------------|------------------------------------|-----|-----|-----|------|------|------|------|-------------------|
|            | 63                                 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |                   |
| 140 STD    | 96                                 | 97  | 93  | 93  | 93   | 89   | 82   | 78   | 96                |
| 155 STD    | 97                                 | 98  | 95  | 93  | 93   | 89   | 83   | 80   | 97                |
| 170 STD    | 87                                 | 98  | 96  | 94  | 93   | 90   | 84   | 81   | 97                |
| 185 STD    | 98                                 | 98  | 96  | 94  | 95   | 90   | 83   | 80   | 98                |
| 200 STD    | 98                                 | 99  | 96  | 95  | 96   | 90   | 83   | 80   | 99                |
| 250 STD    | 99                                 | 99  | 96  | 95  | 96   | 91   | 84   | 81   | 99                |
| 275 STD    | 99                                 | 100 | 98  | 96  | 96   | 92   | 85   | 82   | 100               |
| 300 STD    | 100                                | 100 | 98  | 97  | 98   | 92   | 85   | 82   | 100               |
| 350 STD    | 100                                | 101 | 99  | 97  | 96   | 93   | 87   | 84   | 100               |
| 375 STD    | 101                                | 101 | 99  | 97  | 98   | 93   | 86   | 83   | 101               |
| 400 STD    | 101                                | 102 | 99  | 98  | 99   | 94   | 86   | 83   | 102               |
| 140 HIGH   | 97                                 | 98  | 94  | 93  | 93   | 89   | 83   | 79   | 97                |
| 155 HIGH   | 98                                 | 98  | 95  | 94  | 93   | 90   | 83   | 80   | 97                |
| 170 HIGH   | 98                                 | 99  | 96  | 94  | 93   | 90   | 84   | 81   | 98                |
| 185 HIGH   | 98                                 | 99  | 96  | 95  | 95   | 90   | 84   | 81   | 99                |
| 200 HIGH   | 99                                 | 99  | 97  | 95  | 96   | 91   | 83   | 80   | 99                |
| 250 HIGH   | 99                                 | 100 | 96  | 96  | 96   | 91   | 84   | 81   | 99                |
| 275 HIGH   | 100                                | 101 | 98  | 96  | 96   | 92   | 85   | 82   | 100               |
| 300 HIGH   | 100                                | 101 | 98  | 97  | 98   | 92   | 85   | 82   | 101               |
| 350 HIGH   | 101                                | 102 | 99  | 97  | 96   | 93   | 87   | 84   | 101               |
| 375 HIGH   | 101                                | 102 | 100 | 98  | 98   | 93   | 87   | 84   | 102               |
| 400 HIGH   | 102                                | 102 | 100 | 98  | 99   | 94   | 86   | 84   | 102               |

Sound Power is a calculated quantity and cannot be measured directly like SOUND PRESSURE. Sound power is the amount of acoustical power produced at the source, and thus is an absolute quantity and not dependent on the surrounding environment or distance, as is sound pressure. 32 measurements are taken over a prescribed area around the unit. Data is then mathematically reduced to give the sound power level, dB.

# Appendix B

## Appendix B

### Attenuation Option Information and Sound Data

For acoustically sensitive installations, compressor and fan noise are equally important and should be addressed together to achieve optimal unit sound. The RTAC was designed to have the sound balanced between the compressors and fans. Two options are available for applications needing further attenuation, the Comprehensive Acoustic Solution and the Compressor Sound Enhancement package. NOTE: Attenuation of one component may adversely distort the sound of the other.

### Comprehensive Acoustic Solution

The Comprehensive Acoustic Solution consists of ultra quiet seven blade fans and an enclosure package that reduces the high-frequency, tonal compressor sound. The combination of condenser and compressor attenuation provides a noticeable reduction while keeping the unit sound balanced. Unit reliability and performance will not be affected by the sound attenuation package. Unlike other industry units, the RTAC will not experience any capacity or efficiency decrease due to attenuating fans or compressors.

### Compressor Sound Enhancement

Screw compressors create most of their tonal sound at high-frequencies. In applications where the tonal qualities of screw compressors are the focus of noise reduction, compressor attenuation may be all that is required. The Compressor Sound Enhancement package provides a weatherproof compressor enclosure and piping wraps to reduce compressor sound levels, especially aimed at the high frequencies. The 1-2 dBA sound reduction realized with the compressor sound enhancement package does not reflect the total attenuation achieved because the fans will then contribute more of the overall "A" weighted sound.

**Table B-1 — Sound Pressure Levels 30 ft. From Side of Chiller  
A-Weighted Sound Pressure with Compressor Sound Enhancement**

| Unit Size<br>RTAC | Level, dBA, ref 20 micro Pa |              |
|-------------------|-----------------------------|--------------|
|                   | 60 Hz @ 30 ft               | 50 Hz @ 10 m |
| 140 STD           | 71                          | 66           |
| 155 STD           | 71                          | 67           |
| 170 STD           | 72                          | 67           |
| 185 STD           | 73                          | 68           |
| 200 STD           | 73                          | 68           |
| 225 STD           | 73                          | NA           |
| 250 STD           | 73                          | 69           |
| 275 STD           | 74                          | 69           |
| 300 STD           | 74                          | 70           |
| 350 STD           | 75                          | 70           |
| 375 STD           | NA                          | 71           |
| 400 STD           | 76                          | 71           |
| 450 STD           | 76                          | NA           |
| 500 STD           | 76                          | NA           |
| 140 HIGH          | 71                          | 67           |
| 155 HIGH          | 72                          | 68           |
| 170 HIGH          | 73                          | 68           |
| 185 HIGH          | 73                          | 68           |
| 200 HIGH          | 73                          | 69           |
| 225 HIGH          | 73                          | NA           |
| 250 HIGH          | 74                          | 69           |
| 275 HIGH          | 74                          | 70           |
| 300 HIGH          | 75                          | 70           |
| 350 HIGH          | 76                          | 71           |
| 375 HIGH          | NA                          | 71           |
| 400 HIGH          | 76                          | 72           |

Note: 30 ft or 10 m is measured from the side of the chiller. Sound radiation at this distance will approximate a line noise source.



# Appendix B

**Table B-2 — Sound Pressure Levels End Opposite Control Box  
A-Weighted Sound Pressure with Compressor Sound Enhancement**

| Unit Size<br>RTAC | Level, dBA, ref 20 micro Pa |              |
|-------------------|-----------------------------|--------------|
|                   | 60 Hz @ 30 ft               | 50 Hz @ 10 m |
| 140 STD           | 67                          | 62           |
| 155 STD           | 67                          | 63           |
| 170 STD           | 68                          | 63           |
| 185 STD           | 68                          | 64           |
| 200 STD           | 69                          | 64           |
| 225 STD           | 69                          | NA           |
| 250 STD           | 69                          | 65           |
| 275 STD           | 70                          | 65           |
| 300 STD           | 70                          | 66           |
| 350 STD           | 71                          | 66           |
| 375 STD           | NA                          | 67           |
| 400 STD           | 72                          | 67           |
| 450 STD           | 72                          | NA           |
| 500 STD           | 72                          | NA           |
| 140 HIGH          | 67                          | 63           |
| 155 HIGH          | 68                          | 64           |
| 170 HIGH          | 69                          | 64           |
| 185 HIGH          | 69                          | 64           |
| 200 HIGH          | 69                          | 65           |
| 225 HIGH          | 69                          | NA           |
| 250 HIGH          | 70                          | 65           |
| 275 HIGH          | 70                          | 66           |
| 300 HIGH          | 71                          | 66           |
| 350 HIGH          | 72                          | 67           |
| 375 HIGH          | NA                          | 67           |
| 400 HIGH          | 72                          | 68           |

**Table B-3 — Sound Pressure Levels Control Box End  
A-Weighted Sound Pressure with Compressor Sound Enhancement**

| Unit Size<br>RTAC | Level, dBA, ref 20 micro Pa |              |
|-------------------|-----------------------------|--------------|
|                   | 60 Hz @ 30 ft               | 50 Hz @ 10 m |
| 140 STD           | 66                          | 61           |
| 155 STD           | 66                          | 62           |
| 170 STD           | 67                          | 62           |
| 185 STD           | 67                          | 63           |
| 200 STD           | 68                          | 63           |
| 225 STD           | 68                          | NA           |
| 250 STD           | 68                          | 64           |
| 275 STD           | 69                          | 64           |
| 300 STD           | 69                          | 65           |
| 350 STD           | 70                          | 65           |
| 375 STD           | NA                          | 66           |
| 400 STD           | 71                          | 66           |
| 450 STD           | 71                          | NA           |
| 500 STD           | 71                          | NA           |
| 140 HIGH          | 66                          | 62           |
| 155 HIGH          | 67                          | 63           |
| 170 HIGH          | 68                          | 63           |
| 185 HIGH          | 68                          | 63           |
| 200 HIGH          | 68                          | 64           |
| 225 HIGH          | 68                          | NA           |
| 250 HIGH          | 69                          | 64           |
| 275 HIGH          | 69                          | 65           |
| 300 HIGH          | 70                          | 65           |
| 350 HIGH          | 71                          | 66           |
| 375 HIGH          | NA                          | 66           |
| 400 HIGH          | 71                          | 67           |





## Appendix B

**Table B-4 — Sound Pressure Levels 30 ft. From Side of Chiller  
A-Weighted Sound Pressure with Comprehensive Acoustic Solution**

| Unit Size | Level, dBA, ref 20 micro Pa |              |
|-----------|-----------------------------|--------------|
|           | 60 Hz @ 30 ft               | 50 Hz @ 10 m |
| RTAC      |                             |              |
| 140 STD   | 67                          | 64           |
| 155 STD   | 68                          | 64           |
| 170 STD   | 69                          | 65           |
| 185 STD   | 70                          | 65           |
| 200 STD   | 70                          | 66           |
| 225 STD   | 70                          | NA           |
| 250 STD   | 70                          | 66           |
| 275 STD   | 71                          | 67           |
| 300 STD   | 72                          | 68           |
| 350 STD   | 72                          | 68           |
| 375 STD   | NA                          | 68           |
| 400 STD   | 73                          | 69           |
| 450 STD   | 73                          | NA           |
| 500 STD   | 73                          | NA           |
| 140 HIGH  | 68                          | 64           |
| 155 HIGH  | 69                          | 65           |
| 170 HIGH  | 70                          | 65           |
| 185 HIGH  | 70                          | 66           |
| 200 HIGH  | 70                          | 66           |
| 225 HIGH  | 70                          | NA           |
| 250 HIGH  | 71                          | 67           |
| 275 HIGH  | 71                          | 67           |
| 300 HIGH  | 72                          | 68           |
| 350 HIGH  | 73                          | 68           |
| 375 HIGH  | NA                          | 69           |
| 400 HIGH  | 73                          | 69           |

Note: 30 ft or 10 m is measured from the side of the chiller. Sound radiation at this distance will approximate a line noise source.



# Appendix B

**Table B-5 — Sound Pressure Levels End Opposite Control Box  
A-Weighted Sound Pressure with Comprehensive Acoustic Solution**

| Unit Size<br>RTAC | Level, dBA, ref 20 micro Pa |              |
|-------------------|-----------------------------|--------------|
|                   | 60 Hz @ 30 ft               | 50 Hz @ 10 m |
| 140 STD           | 63                          | 60           |
| 155 STD           | 64                          | 60           |
| 170 STD           | 65                          | 61           |
| 185 STD           | 65                          | 61           |
| 200 STD           | 66                          | 62           |
| 225 STD           | 66                          | NA           |
| 250 STD           | 66                          | 62           |
| 275 STD           | 67                          | 63           |
| 300 STD           | 68                          | 64           |
| 350 STD           | 68                          | 64           |
| 375 STD           | NA                          | 64           |
| 400 STD           | 69                          | 65           |
| 450 STD           | 69                          | NA           |
| 500 STD           | 69                          | NA           |
| 140 HIGH          | 64                          | 60           |
| 155 HIGH          | 65                          | 61           |
| 170 HIGH          | 66                          | 61           |
| 185 HIGH          | 66                          | 62           |
| 200 HIGH          | 66                          | 62           |
| 225 HIGH          | 66                          | NA           |
| 250 HIGH          | 67                          | 63           |
| 275 HIGH          | 67                          | 63           |
| 300 HIGH          | 68                          | 64           |
| 350 HIGH          | 69                          | 64           |
| 375 HIGH          | NA                          | 65           |
| 400 HIGH          | 69                          | 65           |

**Table B-6 — Sound Pressure Levels Control Box End  
A-Weighted Sound Pressure with Comprehensive Acoustic Solution**

| Unit Size<br>RTAC | Level, dBA, ref 20 micro Pa |              |
|-------------------|-----------------------------|--------------|
|                   | 60 Hz @ 30 ft               | 50 Hz @ 10 m |
| 140 STD           | 66                          | 59           |
| 155 STD           | 66                          | 59           |
| 170 STD           | 67                          | 60           |
| 185 STD           | 67                          | 60           |
| 200 STD           | 62                          | 61           |
| 225 STD           | 62                          | NA           |
| 250 STD           | 62                          | 61           |
| 275 STD           | 69                          | 62           |
| 300 STD           | 69                          | 63           |
| 350 STD           | 70                          | 63           |
| 375 STD           | NA                          | 63           |
| 400 STD           | 71                          | 64           |
| 450 STD           | 71                          | NA           |
| 500 STD           | 71                          | NA           |
| 140 HIGH          | 66                          | 59           |
| 155 HIGH          | 67                          | 60           |
| 170 HIGH          | 68                          | 60           |
| 185 HIGH          | 68                          | 61           |
| 200 HIGH          | 68                          | 61           |
| 225 HIGH          | 68                          | NA           |
| 250 HIGH          | 69                          | 62           |
| 275 HIGH          | 69                          | 62           |
| 300 HIGH          | 70                          | 63           |
| 350 HIGH          | 71                          | 63           |
| 375 HIGH          | NA                          | 64           |
| 400 HIGH          | 71                          | 64           |



# Appendix B

**Table B-7 (60 Hz) — Octave Band Sound Power Levels, dB ref, 1 pw WITH COMPREHENSIVE ACOUSTIC SOLUTION**

| Model RTAC | Octave Band & Center Frequency, Hz |     |     |     |      |      |      |      | Overall A' Wtd |
|------------|------------------------------------|-----|-----|-----|------|------|------|------|----------------|
|            | 63                                 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |                |
| 140 STD    | 87                                 | 95  | 96  | 93  | 90   | 88   | 81   | 76   | 95             |
| 155 STD    | 87                                 | 96  | 96  | 94  | 91   | 89   | 82   | 77   | 96             |
| 170 STD    | 88                                 | 96  | 97  | 95  | 92   | 90   | 82   | 77   | 97             |
| 185 STD    | 88                                 | 97  | 97  | 96  | 92   | 90   | 83   | 78   | 97             |
| 200 STD    | 88                                 | 97  | 98  | 96  | 92   | 89   | 81   | 79   | 98             |
| 225 STD    | 88                                 | 97  | 98  | 97  | 92   | 90   | 81   | 79   | 98             |
| 250 STD    | 88                                 | 97  | 99  | 97  | 92   | 90   | 81   | 79   | 98             |
| 275 STD    | 90                                 | 98  | 99  | 97  | 94   | 92   | 85   | 80   | 99             |
| 300 STD    | 89                                 | 99  | 100 | 98  | 94   | 91   | 85   | 81   | 100            |
| 350 STD    | 90                                 | 99  | 100 | 98  | 94   | 92   | 85   | 81   | 100            |
| 400 STD    | 91                                 | 100 | 101 | 99  | 95   | 92   | 87   | 82   | 101            |
| 450 STD    | 91                                 | 100 | 101 | 100 | 95   | 93   | 87   | 82   | 101            |
| 500 STD    | 91                                 | 101 | 102 | 100 | 96   | 93   | 87   | 82   | 101            |
| 140 HIGH   | 88                                 | 96  | 97  | 94  | 91   | 88   | 82   | 77   | 96             |
| 155 HIGH   | 88                                 | 97  | 97  | 95  | 91   | 90   | 83   | 78   | 97             |
| 170 HIGH   | 88                                 | 97  | 97  | 95  | 92   | 91   | 83   | 78   | 98             |
| 185 HIGH   | 88                                 | 97  | 98  | 96  | 92   | 90   | 84   | 79   | 98             |
| 200 HIGH   | 88                                 | 98  | 98  | 97  | 93   | 90   | 81   | 79   | 98             |
| 225 HIGH   | 88                                 | 98  | 99  | 97  | 93   | 90   | 81   | 79   | 98             |
| 250 HIGH   | 89                                 | 98  | 99  | 97  | 93   | 91   | 81   | 79   | 99             |
| 275 HIGH   | 90                                 | 99  | 99  | 97  | 94   | 92   | 85   | 80   | 99             |
| 300 HIGH   | 90                                 | 99  | 100 | 98  | 94   | 91   | 86   | 81   | 100            |
| 350 HIGH   | 91                                 | 100 | 100 | 98  | 95   | 94   | 86   | 81   | 101            |
| 400 HIGH   | 91                                 | 101 | 101 | 100 | 96   | 93   | 87   | 82   | 101            |

Sound Power is a calculated quantity and cannot be measured directly like SOUND PRESSURE. Sound power is the amount of acoustical power produced at the source, and thus is an absolute quantity and not dependent on the surrounding environment or distance, as is sound pressure. 32 measurements are taken over a prescribed area around the unit. Data is then mathematically reduced to give the sound power level, dB.

**Table B-8 (50 Hz) — Octave Band Sound Power Levels, dB ref, 1 pw WITH COMPREHENSIVE ACOUSTIC SOLUTION**

| Model RTAC | Octave Band & Center Frequency, Hz |     |     |     |      |      |      |      | Overall A' Wtd |
|------------|------------------------------------|-----|-----|-----|------|------|------|------|----------------|
|            | 63                                 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |                |
| 140 STD    | 86                                 | 91  | 91  | 89  | 86   | 85   | 78   | 72   | 92             |
| 140 HIGH   | 86                                 | 91  | 92  | 89  | 87   | 85   | 78   | 73   | 92             |
| 155 STD    | 86                                 | 91  | 93  | 89  | 87   | 86   | 79   | 74   | 92             |
| 155 HIGH   | 86                                 | 92  | 93  | 90  | 87   | 86   | 79   | 74   | 93             |
| 170 STD    | 85                                 | 91  | 94  | 90  | 87   | 86   | 80   | 75   | 93             |
| 170 HIGH   | 85                                 | 92  | 95  | 90  | 87   | 86   | 80   | 75   | 93             |
| 185 STD    | 84                                 | 92  | 94  | 90  | 88   | 86   | 79   | 74   | 93             |
| 185 HIGH   | 85                                 | 92  | 95  | 91  | 88   | 87   | 80   | 75   | 94             |
| 200 STD    | 84                                 | 92  | 94  | 91  | 89   | 87   | 79   | 74   | 94             |
| 200 HIGH   | 84                                 | 93  | 95  | 91  | 89   | 87   | 79   | 74   | 94             |
| 250 STD    | 87                                 | 93  | 94  | 91  | 89   | 88   | 80   | 74   | 94             |
| 250 HIGH   | 87                                 | 93  | 95  | 92  | 89   | 88   | 80   | 75   | 95             |
| 275 STD    | 86                                 | 93  | 96  | 92  | 89   | 88   | 81   | 76   | 95             |
| 275 HIGH   | 87                                 | 94  | 96  | 92  | 90   | 88   | 81   | 77   | 95             |
| 300 STD    | 86                                 | 94  | 96  | 92  | 91   | 89   | 80   | 75   | 96             |
| 300 HIGH   | 86                                 | 94  | 96  | 93  | 91   | 89   | 81   | 76   | 96             |
| 350 STD    | 88                                 | 94  | 97  | 93  | 90   | 89   | 83   | 78   | 96             |
| 350 HIGH   | 88                                 | 95  | 98  | 93  | 90   | 89   | 83   | 78   | 96             |
| 375 STD    | 88                                 | 95  | 97  | 93  | 91   | 90   | 82   | 77   | 96             |
| 375 HIGH   | 88                                 | 95  | 98  | 94  | 91   | 90   | 83   | 78   | 97             |
| 400 STD    | 87                                 | 95  | 97  | 94  | 92   | 90   | 82   | 77   | 97             |
| 400 HIGH   | 87                                 | 96  | 98  | 94  | 92   | 90   | 82   | 77   | 97             |

Sound Power is a calculated quantity and cannot be measured directly like SOUND PRESSURE. Sound power is the amount of acoustical power produced at the source, and thus is an absolute quantity and not dependent on the surrounding environment or distance, as is sound pressure. 32 measurements are taken over a prescribed area around the unit. Data is then mathematically reduced to give the sound power level, dB.



# Appendix B

**Table B-9 (60 Hz) — Octave Band Sound Power Levels, dB ref, 1 pw WITH COMPRESSOR SOUND ENHANCEMENT**

| Model RTAC | Octave Band & Center Frequency, Hz |     |     |     |      |      |      |      | Overall<br>A' Wtd |
|------------|------------------------------------|-----|-----|-----|------|------|------|------|-------------------|
|            | 63                                 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |                   |
| 140 STD    | 101                                | 102 | 98  | 96  | 94   | 90   | 85   | 83   | 99                |
| 155 STD    | 102                                | 102 | 98  | 97  | 94   | 91   | 86   | 93   | 99                |
| 170 STD    | 102                                | 103 | 98  | 98  | 95   | 92   | 86   | 84   | 100               |
| 185 STD    | 102                                | 103 | 99  | 98  | 95   | 91   | 87   | 84   | 100               |
| 200 STD    | 103                                | 104 | 99  | 99  | 96   | 91   | 87   | 85   | 101               |
| 225 STD    | 103                                | 104 | 100 | 99  | 96   | 92   | 87   | 85   | 101               |
| 250 STD    | 104                                | 104 | 100 | 100 | 96   | 92   | 88   | 85   | 101               |
| 275 STD    | 104                                | 105 | 101 | 100 | 97   | 93   | 88   | 86   | 102               |
| 300 STD    | 105                                | 105 | 101 | 101 | 97   | 93   | 89   | 86   | 102               |
| 350 STD    | 105                                | 106 | 102 | 101 | 98   | 94   | 89   | 87   | 103               |
| 400 STD    | 106                                | 107 | 102 | 102 | 99   | 94   | 90   | 88   | 104               |
| 450 STD    | 106                                | 107 | 103 | 102 | 99   | 95   | 90   | 88   | 104               |
| 500 STD    | 107                                | 107 | 103 | 103 | 99   | 95   | 91   | 88   | 104               |
| 140 HIGH   | 102                                | 103 | 98  | 97  | 95   | 90   | 86   | 84   | 99                |
| 155 HIGH   | 102                                | 103 | 99  | 98  | 95   | 91   | 87   | 84   | 100               |
| 170 HIGH   | 103                                | 104 | 99  | 98  | 96   | 92   | 87   | 84   | 101               |
| 185 HIGH   | 103                                | 104 | 100 | 99  | 96   | 92   | 87   | 85   | 101               |
| 200 HIGH   | 103                                | 104 | 100 | 99  | 96   | 92   | 88   | 85   | 101               |
| 225 HIGH   | 103                                | 104 | 100 | 99  | 96   | 92   | 88   | 85   | 101               |
| 250 HIGH   | 104                                | 105 | 101 | 100 | 97   | 93   | 88   | 86   | 102               |
| 275 HIGH   | 105                                | 105 | 101 | 100 | 97   | 94   | 89   | 86   | 102               |
| 300 HIGH   | 105                                | 106 | 102 | 101 | 98   | 93   | 89   | 87   | 103               |
| 350 HIGH   | 106                                | 107 | 102 | 101 | 99   | 95   | 90   | 87   | 104               |
| 400 HIGH   | 107                                | 107 | 103 | 102 | 99   | 95   | 91   | 88   | 104               |

Sound Power is a calculated quantity and cannot be measured directly like SOUND PRESSURE. Sound power is the amount of acoustical power produced at the source, and thus is an absolute quantity and not dependent on the surrounding environment or distance, as is sound pressure. 32 measurements are taken over a prescribed area around the unit. Data is then mathematically reduced to give the sound power level, dB.

**Table B-10 (50 Hz) — Octave Band Sound Power Levels, dB ref, 1 pw WITH COMPRESSOR SOUND ENHANCEMENT**

| Model RTAC | Octave Band & Center Frequency, Hz |     |     |     |      |      |      |      | Overall<br>A' Wtd |
|------------|------------------------------------|-----|-----|-----|------|------|------|------|-------------------|
|            | 63                                 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |                   |
| 140 STD    | 96                                 | 97  | 93  | 92  | 89   | 86   | 81   | 78   | 94                |
| 155 STD    | 97                                 | 98  | 94  | 92  | 90   | 87   | 82   | 79   | 95                |
| 170 STD    | 97                                 | 98  | 95  | 93  | 90   | 87   | 82   | 79   | 95                |
| 185 STD    | 98                                 | 98  | 95  | 93  | 91   | 88   | 82   | 79   | 96                |
| 200 STD    | 98                                 | 99  | 96  | 94  | 91   | 88   | 82   | 79   | 96                |
| 250 STD    | 99                                 | 99  | 96  | 94  | 92   | 89   | 83   | 80   | 97                |
| 275 STD    | 99                                 | 100 | 97  | 95  | 92   | 89   | 84   | 81   | 97                |
| 300 STD    | 100                                | 100 | 97  | 95  | 93   | 90   | 84   | 81   | 98                |
| 350 STD    | 100                                | 101 | 98  | 96  | 93   | 90   | 85   | 82   | 98                |
| 375 STD    | 101                                | 101 | 98  | 96  | 94   | 91   | 85   | 82   | 99                |
| 400 STD    | 101                                | 102 | 99  | 97  | 94   | 91   | 85   | 83   | 99                |
| 140 HIGH   | 97                                 | 98  | 93  | 93  | 90   | 87   | 82   | 79   | 95                |
| 155 HIGH   | 98                                 | 98  | 95  | 93  | 90   | 87   | 82   | 79   | 96                |
| 170 HIGH   | 98                                 | 99  | 96  | 93  | 91   | 88   | 83   | 80   | 96                |
| 185 HIGH   | 98                                 | 99  | 96  | 94  | 91   | 88   | 83   | 80   | 96                |
| 200 HIGH   | 99                                 | 99  | 96  | 94  | 92   | 88   | 83   | 80   | 97                |
| 250 HIGH   | 99                                 | 100 | 96  | 95  | 92   | 89   | 84   | 81   | 97                |
| 275 HIGH   | 100                                | 100 | 97  | 95  | 93   | 90   | 84   | 82   | 98                |
| 300 HIGH   | 100                                | 101 | 98  | 96  | 94   | 90   | 84   | 82   | 98                |
| 350 HIGH   | 101                                | 102 | 99  | 96  | 94   | 91   | 86   | 83   | 99                |
| 375 HIGH   | 101                                | 102 | 99  | 97  | 94   | 91   | 86   | 83   | 99                |
| 400 HIGH   | 102                                | 102 | 99  | 97  | 95   | 91   | 86   | 83   | 100               |

Sound Power is a calculated quantity and cannot be measured directly like SOUND PRESSURE. Sound power is the amount of acoustical power produced at the source, and thus is an absolute quantity and not dependent on the surrounding environment or distance, as is sound pressure. 32 measurements are taken over a prescribed area around the unit. Data is then mathematically reduced to give the sound power level, dB.



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|                         |                              |
|-------------------------|------------------------------|
| Literature Order Number | RLC-PRB009-EN                |
| File Number             | PL-RF-RLC-000-PRB009-EN-0602 |
| Supersedes              | RLC-PRB009-EN-0401           |
| Stocking Location       | La Crosse                    |

For more information contact your local district office or e-mail us at [comfort@trane.com](mailto:comfort@trane.com)

*Trane has a policy of continuous product and product data improvement and reserves the right to change design and specifications without notice.*

**CVS CONSENT JUDGMENT**

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TRUEX AND MORLEY, P.C.

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February 16, 2004

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Maryanne Cornelius, City Clerk  
CITY OF NOVI  
45175 West Ten Mile Road  
Novi, MI 48375

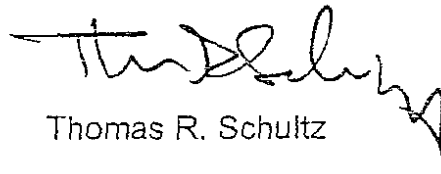
RE: *City of Novi v CVS Michigan Distribution, Inc. and CVS Pharmacy, Inc.*  
Oakland County Circuit Court Case No. 01-036902-CZ  
Our File No. 55142 NOV

Dear Ms. Cornelius:

Attached, for the City Clerk's file, is the final Amended Consent Judgment in connection with the above matter, as entered with the Court on February 13, 2004.

If you have any questions regarding the above, please do not hesitate to call me.

Very truly yours,



Thomas R. Schultz

TRS/jes

Enclosure

cc: Rick Helwig, City Manager  
Craig Klaver, Chief Operating Officer  
Clay Pearson, Assistant City Manager  
Don Saven, Building Official  
Cindy Uglow, Neighborhood Services  
Gerald A. Fisher, Esq.

556371\_1

STATE OF MICHIGAN  
IN THE CIRCUIT COURT FOR THE COUNTY OF OAKLAND

CITY OF NOVI,

Plaintiff,

vs.

CVS MICHIGAN DISTRIBUTION,  
INC., and CVS PHARMACY, INC.,

Defendants.

and

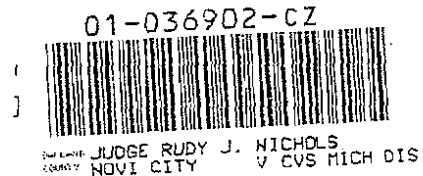
WEC-2001A-DC-2, LLC, a Delaware limited  
liability company, and WEC 2001A-DC-2A, LLC,  
a Delaware limited liability company, Jointly,

Added Defendants.

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Bingham Farms, MI 48025-2457  
(248) 566-8460

AMENDED CONSENT JUDGMENT



At a session of said Court, held in the  
Oakland County Courthouse Tower, Pontiac, Michigan  
on FEB 13 2004, 2004.

PRESENT: RUDY J. NICHOLS  
CIRCUIT COURT JUDGE

This Court having found that:

1. Following the "test period" described in the original Consent Judgment in the above-entitled matter, dated February 26, 2003, the parties hereto have reached a settlement of all Plaintiff's claims relating to use of the property in the City of Novi described on Exhibit A hereto (the "Property") and the operation by Defendants of the warehouse on the Property, and of all claims pleaded in and which are the subject of this suit; and

2. The parties have stipulated to entry of this Amended Consent Judgment; and

3. This Amended Consent Judgment embodies a full and complete settlement of all such claims, subject to the conditions and limitations set forth below;

NOW, THEREFORE, it is hereby ordered and adjudged as follows:

1. Defendants shall after entry of this Amended Consent Judgment have a right to and may operate their warehouse business on the Property in accordance with all prior approvals and applicable regulations, and without restriction as to hours of operation. Such operation shall, however, be subject to the regulations set forth in paragraphs 2 through 5 below.

2. The fans on the west wall of the north building shall not run from 6 p.m. to 6 a.m. Defendants shall install a digital timer with battery backup, timed to cause the fans to shut down at 6 p.m., and not to recommence running until after 6 a.m.

3. Defendants shall regularly maintain the fans, so as to keep them in proper working order, such that they do not cause noise levels at the rear property line opposite the west wall of the north building in excess of applicable ordinance noise level limits. Plaintiff shall have the right and

authority to enter upon the Defendants' property to determine compliance with this requirement (or any other requirement of this Amended Consent Judgment) upon 24 hours written notice to Defendants' Warehouse Director (or other appropriate on-site personnel) at the address of the warehouse operations.

4. Defendants shall not run the fans on the west wall of the north building at any time on non-working weekends or non-working holidays. Defendants represent, and acknowledge Plaintiff's reliance on such representation, that Defendants do not now regularly operate the warehouse facilities on weekends or holidays.

5. It is the understanding and intention of the parties that, in complying with the terms of this Amended Consent Judgment, Defendants will not cause an attendant increase in noise coming to the affected residential properties from other areas of the building.

6. This Amended Consent Judgment and all of its obligations and restrictions shall run with the land constituting the Property and shall be binding upon and shall benefit the parties hereto and their respective heirs, successors, assigns, and transferees. WEC-2001A-DC-2, LLC, a Delaware limited liability company and WEC 2001A-DC-2A, LLC, a Delaware limited liability company, jointly as Landlord are hereby added as party Defendants and signatories to this action and Consent Judgment to be bound by its terms.

7. The Court shall retain jurisdiction over this matter for purposes of, and to the extent necessary for, the administration and enforcement of the terms and provisions of this Amended Consent Judgment and for the resolution of any dispute arising between the undersigned parties pertaining to their respective obligations and/or rights under this Amended Consent Judgment. The Court retains all legal and equitable remedial powers in the event Defendants fail to comply with the terms and conditions of this Amended Consent Judgment

8. This Amended Consent Judgment is hereby deemed to be a recordable instrument, in recordable form, which may be presented to the Oakland County Register of Deeds office for recording by any of the parties hereto.

9. To the extent that this Amended Consent Judgment conflicts with any City ordinance requirements, the terms of this Amended Consent Judgment shall control. To the extent that this Amended Consent Judgment is silent on issues regulated by City ordinances, then the City ordinances shall control.

10. No costs or attorney fees shall be awarded to either party.

11. This constitutes a final order and resolves all pending claims and closes the case.

### STIPULATION

We stipulate to entry of the foregoing Amended Consent Judgment.

SECRETST, WARDLE, LYNCH,  
HAMPTON, TRUEX AND MORLEY  
Attorneys for Plaintiff City of Novi

HONIGMAN MILLER SCHWARTZ AND  
COHN LLP  
Attorneys for Defendants CVS Michigan  
Distribution, Inc., CVS Pharmacy, Inc.,  
WEC-2001A-DC-2, LLC, and  
WEC 2001A-DC-2A, LLC

By: \_\_\_\_\_

Thomas R. Schultz (P42111)

By: \_\_\_\_\_

Norman Hymen (P15319)

Dated: February 13, 2004

549156

**A TRUE COPY**  
**G. WILLIAM CADDELL**  
Oakland County Clerk - Register of Deeds

By: \_\_\_\_\_  
Deputy

**RUDY J. NICHOLS**

Hon Rudy J Nichols

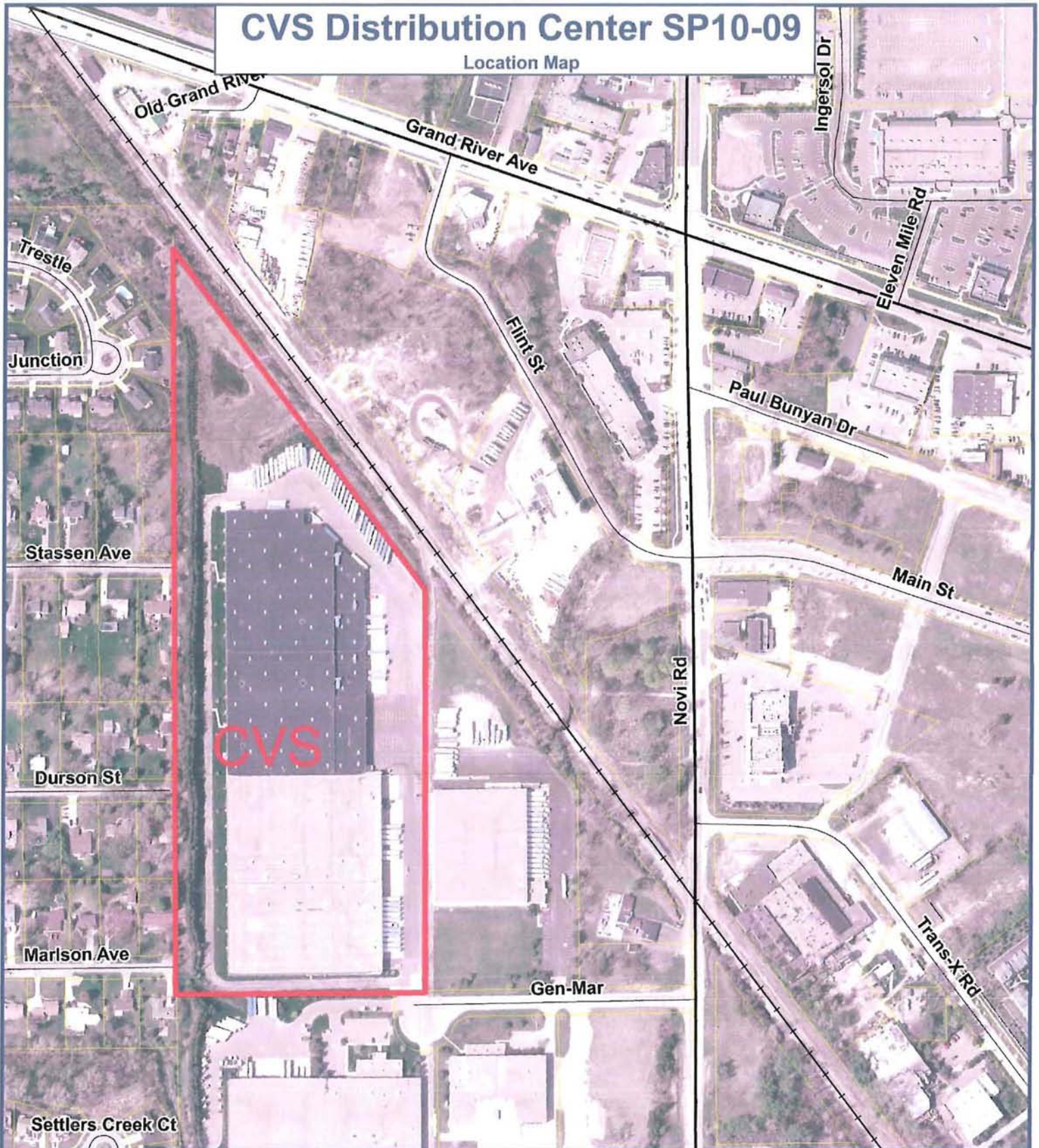
**MAPS**

**Location/Air Photo  
Zoning**



# CVS Distribution Center SP10-09

Location Map



Map Author: Mark Spencer  
 Date: 2/22/10  
 Project: CVS Chiller  
 Version #: 1.0

### Map Legend

 Tax Parcels

#### MAP INTERPRETATION NOTICE

Map information depicted is not intended to replace or substitute for any official or primary source. This map was intended to meet National Map Accuracy Standards and use the most recent, accurate sources available to the people of the City of Novi. Boundary measurements and area calculations are approximate and should not be construed as survey measurements performed by a licensed Michigan Surveyor as defined in Michigan Public Act 132 of 1970 as amended. Please contact the City GIS Manager to confirm source and accuracy information related to this map.



**City of Novi**  
 Planning Division  
 Community Development Dept.  
 45175 W Ten Mile Rd  
 Novi, MI 48375  
 cityofnovi.org

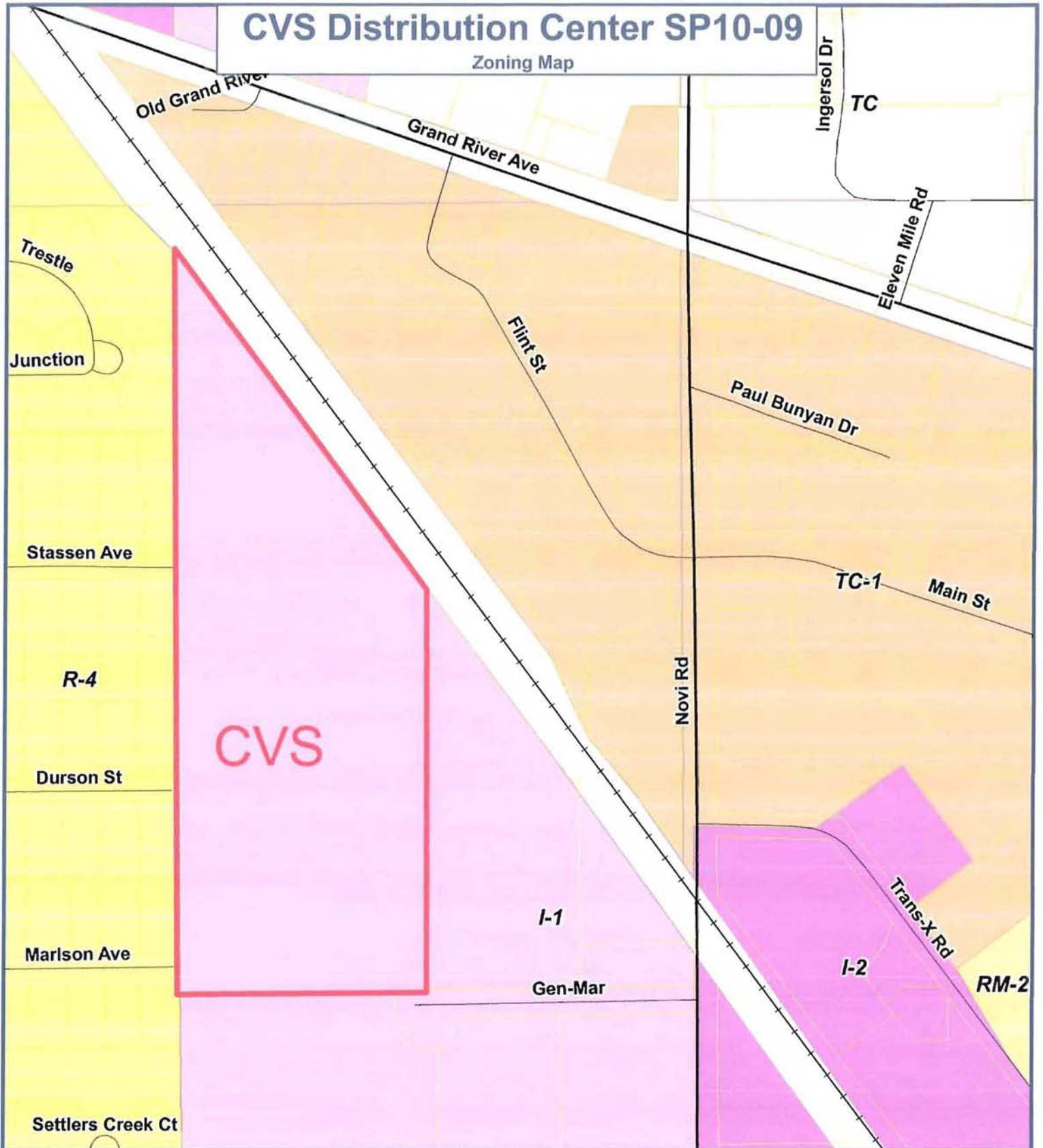


1 inch = 340 feet



# CVS Distribution Center SP10-09

Zoning Map



Map Author: Mark Spencer  
 Date: 2/22/10  
 Project: CVS Chiller  
 Version #: 1.0



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**Map Legend**

**Zoning**

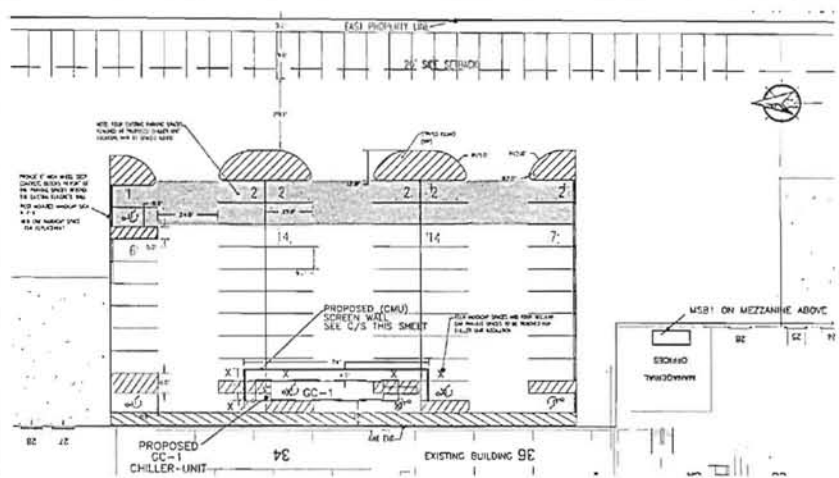
- R-4: One-Family Residential District
- RM-2: High-Density Multiple Family
- I-1: Light Industrial District
- I-2: General Industrial District
- RC: Regional Center District
- P-1: Vehicular Parking District
- TC: Town Center District
- TC-1: Town Center -1 District



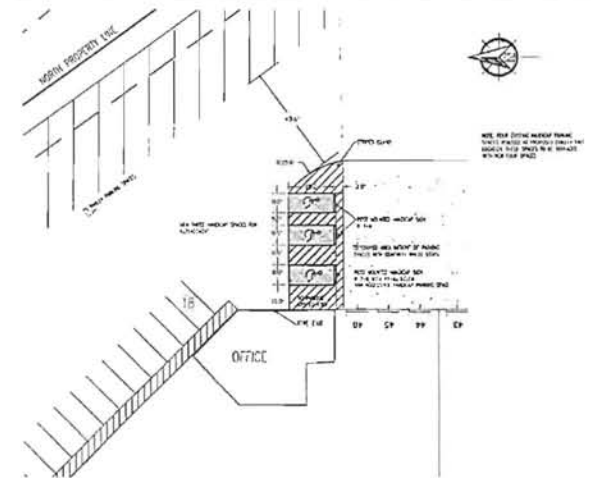
**City of Novi**  
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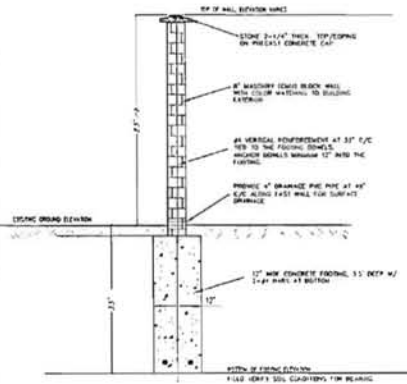
REDUCED SITE PLAN



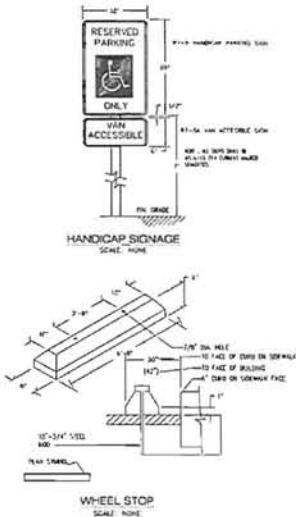
CHILLER UNIT AREA LAYOUT  
SCALE: 1"=20'



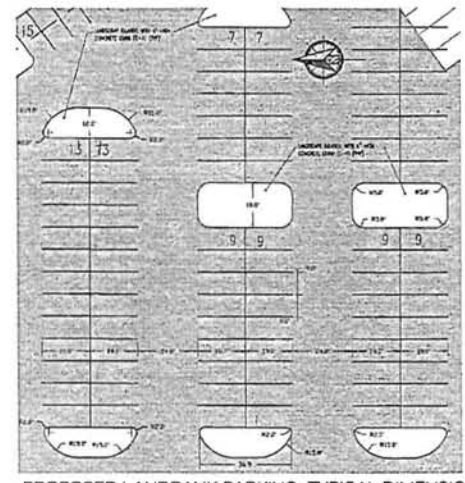
PROPOSED HANDICAP PARKING LAYOUT NEAR OFFICE  
SCALE: 1"=20'



TYPICAL CROSS SECTION OF SCREEN (CMU) WALL  
SCALE: NONE



WHEEL STOP  
SCALE: NONE



PROPOSED LANDBANK PARKING, TYPICAL DIMENSIONS  
SCALE: 1"=20'



|          |         |    |          |         |    |
|----------|---------|----|----------|---------|----|
| DATE     | ISSUE   | BY | DATE     | ISSUE   | BY |
| 08/20/20 | REVISED | AW | 08/20/20 | REVISED | AW |

PROPRIETORS: CVS PHARMACY  
CVS DISTRIBUTION CENTER  
43800 CEM-WAR DRIVE  
NOVI, MICHIGAN 48235  
ATTN: MR. JAMIE HAWKINS

FAIRWAY ENGINEERING LLC  
22045 NOVI ROAD, SUITE 148  
NOVI, MI 48240  
(248) 214-2910  
FAX: (248) 240-0261

REVISED SITE PLAN DETAILS  
CVS DISTRIBUTION CENTER  
43800 CEM-WAR DRIVE  
CITY OF NOVI, OAKLAND COUNTY, MICHIGAN

SCALE: 1"=20'  
SHEET: C-4  
PROJECT: FF09526



**PARCEL DESCRIPTION OF CVS WAREHOUSE SITE**

Parcel description of the CVS Warehouse Site, located at the corner of Novi Road C/L and Stasson Ave, City of Novi, Oakland County, Michigan. The parcel is bounded by Novi Road C/L to the north, Stasson Ave to the east, and the intersection of Novi Road C/L and Stasson Ave to the south and west. The parcel is approximately 1.5 acres in size and is currently zoned R-1. The parcel is owned by CVS Health Inc. and is being proposed for conversion to a warehouse facility. The parcel is shown on the attached plat and is subject to the provisions of the City of Novi Zoning Ordinance.

**PARCEL DESCRIPTION OF CONSERVATION EASEMENT**

The parcel is subject to a conservation easement held by the City of Novi. The easement covers approximately 0.5 acres of the parcel and is intended to preserve the natural resources of the area. The easement is shown on the attached plat and is subject to the provisions of the City of Novi Conservation Easement Ordinance. The easement is held in fee simple by the City of Novi and is not subject to any other interests.

**CURRENT PROPOSED SCOPE OF WORK**

- 1) REMOVE EXISTING CONCRETE DRIVE AND RECONSTRUCT WITH ASPHALT DRIVE.
- 2) INSTALL A GRASS STRIP (GSI) WITH EXISTING PAVING FOR ADA COMPLIANCE AND TO PROVIDE A BUFFER BETWEEN THE DRIVE AND THE BUILDING. INSTALL AN ASPHALT DRIVE AND CONCRETE DRIVE TO PROVIDE ACCESS TO THE BUILDING. CONCRETE DRIVE TO BE INSTALLED TO PROVIDE ACCESS TO THE BUILDING. CONCRETE DRIVE TO BE INSTALLED TO PROVIDE ACCESS TO THE BUILDING.
- 3) INSTALL REQUIRED DUCTS AND ELECTRICAL PANELS FOR COLLIER UNIT AND MANUFACTURER'S REQUIREMENTS. ALL DUCTS FROM UNIT TO BE INSTALLED ABOVE ROOF.
- 4) REZONE DESIGNATED AREAS AFTER DRAINAGE/PAVE RECONSTRUCTION.

**VARIANCES REQUESTED**

- 1) VARIANCE FROM ZONING IS REQUESTED FOR RETAIL USE OF COLLIER UNIT OUTSIDE THE EXISTING BUILDING.
- 2) VARIANCE REQUESTED TO INSTALL AIR RADIATION UNITS ABOVE THE EXISTING ROOF.
- 3) VARIANCE REQUESTED TO INSTALL AIR RADIATION UNITS ABOVE THE EXISTING ROOF.

**REVISIONS**

- 1) REVISION 1: ADDITIONAL PARKING SPACES.
- 2) REVISION 2: ADDITIONAL PARKING SPACES.
- 3) REVISION 3: ADDITIONAL PARKING SPACES.

**SITE DATA**

| ITEM           | DESCRIPTION | QUANTITY | UNIT    |
|----------------|-------------|----------|---------|
| LAND AREA      | 1.50 ACRES  | 65,340   | SQ. FT. |
| CONCRETE DRIVE | 1,000       | 1,000    | SQ. YD. |
| ASPHALT DRIVE  | 1,000       | 1,000    | SQ. YD. |
| CONCRETE DRIVE | 1,000       | 1,000    | SQ. YD. |
| ASPHALT DRIVE  | 1,000       | 1,000    | SQ. YD. |
| CONCRETE DRIVE | 1,000       | 1,000    | SQ. YD. |
| ASPHALT DRIVE  | 1,000       | 1,000    | SQ. YD. |
| CONCRETE DRIVE | 1,000       | 1,000    | SQ. YD. |
| ASPHALT DRIVE  | 1,000       | 1,000    | SQ. YD. |

**LEGEND**

| SYMBOL    | DESCRIPTION |
|-----------|-------------|
| [Pattern] | EXISTING    |
| [Pattern] | PROPOSED    |
| [Pattern] | CONCRETE    |
| [Pattern] | ASPHALT     |

**REVISIONS**

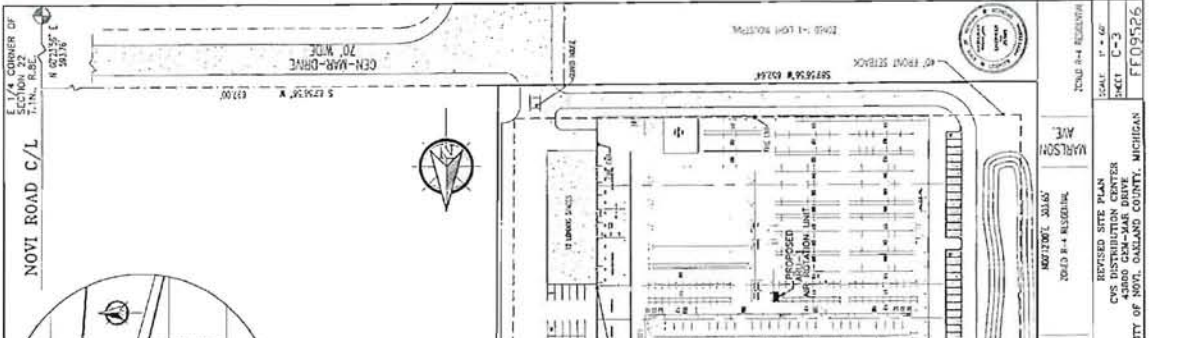
| NO. | DATE       | DESCRIPTION        |
|-----|------------|--------------------|
| 1   | 08/20/2018 | ADD PARKING SPACES |
| 2   | 08/20/2018 | ADD PARKING SPACES |
| 3   | 08/20/2018 | ADD PARKING SPACES |

**PROPRIETORS:** CVS PHARMACY  
 43000 ORCHARD DRIVE  
 WILSON, MI 48095  
 (248) 261-1234

**REVISIONS**

| NO. | DATE       | DESCRIPTION        |
|-----|------------|--------------------|
| 1   | 08/20/2018 | ADD PARKING SPACES |
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