

BEFORE THE POLLUTION CONTROL BOARD
OF THE STATE OF ILLINOIS

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In The Matter Of the Petition Of)
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)
MODERN DROP FORGE COMPANY)
)
)
for a Site Specific Operational Level,)
Pursuant to Chapter 8, Rule 206(d) of)
the Rules and Regulations of the)
Illinois Pollution Control Board)

POLLUTION CONTROL BOARD

No.

PETITION

TO: The Illinois Environmental Protection Agency and
The Illinois Pollution Control Board

Modern Drop Forge Company (hereinafter "Petitioner"), by its attorneys Butler, Rubin, Newcomer & Saltarelli, petition the Pollution Control Board (hereinafter "Board") for a Site Specific Operational Level pursuant to Chapter 8, Rule 206(d) of the Illinois Pollution Control Board Rules & Regulations (hereinafter "PCB Rules & Regs").

In support hereof, Petitioner states as follows:

I.
Identity of Petitioner

1. Petitioner is a corporation duly organized and existing under the laws of the State of Illinois, is authorized to do business in Illinois and maintains an office and manufacturing complex in Blue Island, County of Cook, Illinois.

II.
The Rules At Issue

2. On September 1, 1982 IPCB, Rules & Regs. Ch. 8, Rules 206(c) and (d) became effective pursuant to filing with the Secretary of State and prior action of both the Board and the Joint Committee on Administrative Rules. These Rules amend pre-existing rules of the Board governing the emission of impulsive sound emitted from impact forging operations. Pursuant to Rule 209(h), the Petitioner is required to either (i) comply with the prohibitions contained in Table 7 of Rule 206(c) no later than fifteen months following the effective date of the Rule, or (ii) seek a permanent Site Specific Operational Level. For the reasons set forth below, Petitioner herewith seeks a permanent Site Specific Operational Level for its impact forging operations in lieu of compliance with Table 7 of Rule 206(c).

III.
Rule 206(d)(2)(A)

The location of the Petitioner, a description of
the surrounding community, and a map locating
the Petitioner within the community.

3. The Petitioner is, and has been since 1918, located immediately north and northwest of the intersection of 139th Street and Western Avenue in Blue Island, Illinois. Petitioner's manufacturing complex covers four square blocks; its operations are housed in numerous separate buildings.

4. The property surrounding the Petitioner is zoned for general industry; it is used principally, for industrial pur-

poses, with only a few nearby residential and commercial facilities. In 1918, when Petitioner built its first forge shop at the present location, the surrounding land was vacant except for a cannery constructed in 1915 by Libby, McNeill & Libby. The first two residences constructed in the area were owned by the founders of Modern Drop Forge and still stand on the edge of its property. Over the decades the property surrounding the complex was gradually developed, with the principal residential structure, a girls boarding school and convent, constructed in 1927. The few residents near the Petitioner have, as a consequence, acquired their land with knowledge of Petitioner's operations and at values that already reflect whatever disbenefits exist, if any, as a result of exposure to sound levels from the operations of Petitioner.

5. A map of the community with Petitioner's location identified is attached hereto as Exhibit A. A site plan layout with the location of the buildings containing impact forging hammers and other relevant operations of the Petitioner is attached hereto as Exhibit B.

IV.
Rule 206(d)(2)(B)

A description of the Petitioner's operations, the number and size of the Petitioner's forging hammers, the current hours of hammer operation, the approximate number of forgings manufactured during each of the three prior calendar years and the approximate number of hammer blows used to manufacture the forgings.

6. Forging is essentially a shaping process, accomplished through controlled plastic deformation which permanently

alters the shape and internal structure of the materials used. The alteration improves the materials' mechanical properties and capabilities.

7. Petitioner forges carbon and alloyed carbon steel using "closed dies" to produce products with tolerances as close as plus or minus .005. The dies are two matched blocks which have a particular pattern cut out of them. The metal is heated to nearly 2200 degrees Fahrenheit, then inserted between the dies and pressure is applied. The pressure needed to shape the metal is supplied by the repeated impact of the upper die, which is fastened to a guided ram, falling or driven against the lower die, which is fastened to the anvil. The guided ram, the anvil and the machinery of which they are a part is commonly known as a forge hammer. The sound produced by the forge hammer is impulsive in nature and originates primarily from the impact between the upper die and the workpiece and lower die.

8. Petitioner's manufacturing complex produces different types of forgings ranging in size up to 40 pounds. The forgings include, among other items, connecting rods for engines, pinions and gears for the railroad industry, shifting levers for transmissions, track links for tanks, and door closure arms and pistons.

9. Petitioner employs more than 300 people and is the second largest employer in Blue Island. Many of its employees are local residents. In 1981 the operations utilized raw materials and supplies costing \$14,857,000, of which \$8,827,000 or 59% was purchased in Illinois. In 1981 Petitioner paid \$109,000 in property tax and \$179,000 in unemployment tax.

10. The facility currently contains 20 forging-hammers with a twenty-first hammer on order. The forging hammers currently operate from 6:30 a.m. to 10:15 p.m. five days per week. The forging hammers have historically operated during two shifts from 6:00 a.m. until midnight five days per week, with occasional work on Saturdays from 6:30 a.m. until 7:30 p.m. The forging hammers are air drop, air driven and board drop and range in size from 2,000 lbs. to 8,000 lbs. They are housed in two separate buildings identified as Building Q and Building K. The location of the individual forging hammer units are identified on Exhibit C.

11. Below is a table which identifies the approximate number of forgings manufactured on hammers by Petitioner for each of the last three years, the approximate number of blows used to produce the forgings manufactured on hammers and the weight of all forgings. As can be seen from the table, the number of parts manufactured on hammers has declined recently, as has the total number of blows and total tonnage. The current decline in production is continuing and 1982 production is estimated to be less than 7,000 tons.

	<u>No. of Forgings On Hammers</u>	<u>No. of Blows</u>	<u>Tonnage Of All Forgings</u>
1979	24,800,000	109,282,000	15,900
1980	18,800,000	92,475,000	13,350
1981	12,746,000	67,477,000	9,780

V.
Rule 206(d)(2)(C)

A description of any existing
sound abatement measure.

12. In order to appreciate the difficulty of designing and implementing abatement measures at Petitioner's facility, it is first necessary to understand the manner in which forge plants are constructed and operated, since these conditions virtually preclude technically effective and economically reasonable noise control measures at Petitioner.

13. Petitioner's forging hammers are located in two buildings of similar design, the newest of which was constructed over 30 years ago. The lower level walls of both buildings are composed of brick with roll-open doors. The upper level of Building Q is composed of wire glass panels; the roof is gypsum board and asphalt with a corrugated transite peak. The upper level of Building X is brick at the ends with corrugated fiberglass and steel panel sides with a corrugated transite roof. Both buildings have large open roof ventilators.

The buildings each house forging furnaces which impose a tremendous ventilation requirement on the buildings. The individual furnaces can heat up to 1.3 tons of steel per hour to a temperature of nearly 2,200 degrees Fahrenheit. The buildings have been designed to utilize the "stack effect" for natural ventilation; this is an economical and highly reliable air circulation system. However, ventilation essential to a safe operation, especially during summer months, necessitates that virtually the entire ground floor peri-

meter (the roll-open doors) be open in order to generate sufficient air flow to the work area. Thermal convection currents created by the air heated around the furnaces induce the cooler outside air to enter through the many ground level openings. The heated air exits through the roof ventilators and exhaust fans.

14. The impulsive sound generated by the forging hammers -- persisting for approximately 100 milliseconds -- is also emitted through the many building openings. Thus there is a relationship between adequate ventilation and sound emitted to the environment.

15. In addition to the ventilation demands there are other factors which impact on abatement strategies; these include structural limitations and space requirements. For example, sound absorptive wall treatments and mechanical ventilation cannot be placed on walls or roofs, or hung from beams without altering the existing load carrying capacities. And barriers, even if effective, would in most instances impair access routes to open storage areas and from building to building.

16. Notwithstanding these limitations and the inability to significantly effect emissions, Petitioner has implemented changes at its facility which it hoped would have some positive impact on the sound emitted to the neighborhood. Since 1976 Petitioner has erected five structures between the hammer shops and the neighbors to the north and east of the facility: (i) the EDM building; (ii) the engineering office erected as the second floor of existing offices and lockers; (iii) the foremen's locker room erected as the second floor of the shop offices; (iv) the electrical pump house and cooling tower buildings; and (v) the base milling building. These buildings

are identified on Exhibit B. Petitioner has also begun construction of a sixth new structure north of Building X (Building "Y" on Exhibit B). This new structure was located to reduce noise emitted to the perimeter even though it would have been more economical to construct east of Building Q. In addition to locating the entirely new structures intentionally between the sound source and the receptors, Petitioner had the sides facing the hammer shops of four of the structures constructed with sound-absorbing brick. The additional cost of the sound-absorbing brick over and above the cost of regular brick was \$8,100.00.

17. Petitioner has also closed the upper side vents of the Building Q hammer shop. This project cost \$6,000. Finally, Petitioner is in the process of installing sound attenuators on its dust collectors at a cost of \$10,000. While the sound emitted by the dust collectors is not impulsive, nevertheless Petitioner is installing the control equipment as a further commitment to expend funds where there is a likelihood of real improvement to the local environment.

VI.
Rule 206(d)(2)(D)

The sound levels in excess of those permitted by Table 7 emitted by the Petitioner into the community in 5 decibel increments measured in Leq, shown on the map of the community.

18. Table 7 permits the emission of impulsive sound to Class A receivers of up to 58.5 Leq during the daytime and 53.5 Leq during the nighttime. Exhibit A contains the estimated typical worst case emissions in 5 decibel increments derived from both actual Leq

measurements and data taken in dB(A) (fast meter response). The data taken in dB(A) has been converted to Leq by deducting 5dB; this conversion is based on actual measurements to determine the average difference between the two measurements at Petitioner's facility.

Exhibit A discloses that the typical worst case emission measured at the closest Class A land (other than the houses owned by Modern) is 67 Leq; however this level is estimated to be nearly the limiting case and typically will vary downward, depending upon atmospheric conditions, particularly wind velocity and direction.

VII.
Rule 206(d)(2)(E)

The number of residences exposed to sound levels in excess of those permitted by Table 7.

19. The number of residences exposed to sound levels in excess of those permitted by Table 7 depends on whether the Petitioner operates during nighttime hours or is restricted to daytime operations only. Typically the Petitioner operates two nine-hour shifts between 6:00 a.m. and midnight -- which includes two nighttime hours. Currently, Petitioner is operating only during daytime hours because of the reduced demand for its products. Under usual circumstances the Petitioner is deemed to operate at night and the more restrictive Table 7 nighttime limitation would apply.

20. There are, according to house and mobile home counts made by Petitioner, 1,639 residences potentially exposed to sound levels in excess of 53.5 Leq. This is the theoretical maximum number of residences exposed to levels exceeding Table 7 during the typical

limiting case; however, the limiting case is unlikely to occur simultaneously at all residences impacted by the facility since the limiting case for each residence is dependent on atmospheric conditions which are antithetical to producing the limiting case at other residences. For example, when the wind blows from the southwest to the northeast, the residences to the southwest of the facility will be exposed to levels of sound lower than the limiting case, while those to the north and east may be exposed to levels approaching the limiting case.

21. To Petitioner's knowledge it has never received a complaint from anyone concerning its impact forging operations when conducted between 6:00 a.m. and midnight.

-VIII.
Rule 206(d)(2)(F)

A description of other significant sources of noise (mobile and stationary) and their location shown on the map of the community.

22. There are many significant mobile and stationary sources of noise operating near Petitioner. The mobile noise sources include (i) three railroads, the Grand Trunk Western, the Indiana Harbor Belt and the Chicago, Rock Island and Pacific; moreover, the Indiana Harbor Belt operates a switching yard immediately behind Petitioner and the other two railroads operate many trains each day; and (ii) the intersection of 139th and Western Avenues which has significant truck and tractor-trailer traffic.

The principal stationary source is the former Libby, McNeill & Libby cannery which is now a truck terminal. The terminal operates twenty-four hours per day; not only are trucks moving in and

out of the terminal at all hours, but there are parked, refrigerated trailers which have motors that run continuously.

23. Each of the significant sources of noise is shown on Exhibit A, which is a map of the community.

IX.
Rule 206(c)(2)(G)

A description of the proposed operational level and proposed physical abatement measures, if any, a schedule for their implementation and their costs.

24. Because of the inability to significantly abate the impact sound emitted by the facility (see paragraph 26) Petitioner cannot alter existing community sound levels while continuing to operate. Because of the absence of any need for abatement and the community's satisfaction with Petitioner's operations, Petitioner does not propose to implement any further impact sound abatement measures, nor does it propose to limit its productive capacity or alter its normal hours of operation. Petitioner proposes to operate its 21 hammers six days per week, from 6:00 a.m. until midnight Monday through Friday and from 6:30 a.m. until 7:30 p.m. on Saturday.

X.
Rule 206(d)(2)(H)

The predicted improvement in community sound levels as a result of implementation of the proposed abatement measures.

25. Because of Petitioner's inability to significantly abate the impact sound emitted by its facility, the absence of any need for such abatement and the community's satisfaction with Petitioner's operations, Petitioner will not alter existing community sound levels.

XI.
Rule 206(d)(2)(I)

A description of the economic and technical considerations which justify the permanent site specific allowable operational level sought by Petitioner.

26. In determining the properly allowable operational level for Petitioner the Board must remember that (i) the community surrounding Petitioner grew up with Petitioner already established and as active or more active than today; (ii) to Petitioner's knowledge, the community has never complained about Petitioner's normal hammer operations; (iii) in 1981 members of the union employed at Modern circulated a petition throughout the community surveying all the nearby residents, and found only one person, living in a trailer park, who objected to the sound emanating from Petitioner (see, R76-14, Feb. 23, 1981, Lamore, pp.432-35; Witt, pp.441-44); and (iv) there is no adverse impact on the community's health as a result of the emission of sound from Petitioner's hammer operations. This is the context in which the Board must necessarily review the economic and technical considerations which impact upon the operational level sought by Petitioner.

27. The technical and physical considerations, or limitations, which impact on the proper operational level for Petitioner include (i) there is no available method of controlling sound from forging hammers at the source; (ii) the buildings which house the forging hammers are old, and cannot accommodate significant sound abatement measures without structural alteration; (iii) the furnaces housed along with the hammers create an enormous demand for ventilation; (iv) sound escapes from the buildings through the same

openings as the masses of ventilation air used to cool employees; and (v) space within and around the buildings is limited.

28. These limitations, combined with prevailing atmospheric conditions, preclude meaningful sound abatement at Modern. At considerable expense Modern has had an extensive study of its facility conducted by a leading noise consultant. That consultant considered the various strategies available to Modern, including the erection of barriers constructed of sound-absorbing materials and reached the following conclusions:

- (a) Practical noise barriers have no measurable effect on hammer noise emission at distances approximately 200 feet beyond the noise barrier, under most weather conditions;
- (b) Noise barriers are only effective at greater distances if the atmosphere is homogeneous (no wind or temperature gradients), a condition that seldom exists;
- (c) At distances greater than approximately 250 feet from the hammer shops, weather conditions dominate the forge hammer sound propagation with or without the existence of noise barriers;
- (d) Weather conditions cause the forge hammer sound level to vary up to 2 dBA per 100 feet of distance (i.e., 20 dB at 1,000 feet); and
- (e) Environmental noise control at Modern is not practical.

29. The last conclusion is especially significant; there is no solution that will work at Modern within the realm of economic reasonableness. This includes completely enclosing the shop, since no one in the United States has yet demonstrated a working, completely enclosed renovated forge shop using mechanical ventilation and Petitioner seriously doubts that anyone will do so. Aside from the staggering costs and the absence of demonstrated need for such drastic measures, Petitioner is skeptical that employees will work under such conditions. Even under optimal operating conditions, with the maximum number of grade level doors and windows open, there are summer days when the employees work half shifts or refuse to work at all because of heat stress. Employees of forge shops who testified before the Board in the R76-14 hearings uniformly stated they did not believe they could or would work in a closed environment (See, e.g., R76-14, Feb. 23, 1981, Grabinski, pp.270-74; and Lamore pp.429-31).

30. Consequently there is (i) no practical, simple, economically reasonable solution to abating the sound emitted by Petitioner and (ii) the only potentially effective abatement measure -- reconstructing and closing the hammer shops using mechanical ventilation -- is technically untried, unreasonably expensive under any economic circumstances, unacceptable to affected employees and unnecessary.

31. Therefore the proposed operational level described in paragraph 24 is the only reasonable solution to the economic and technical considerations impinging on the Petitioner's operations. Equally as important is the fact that there is no need or justification for altering the existing operational levels.

Respectfully submitted,

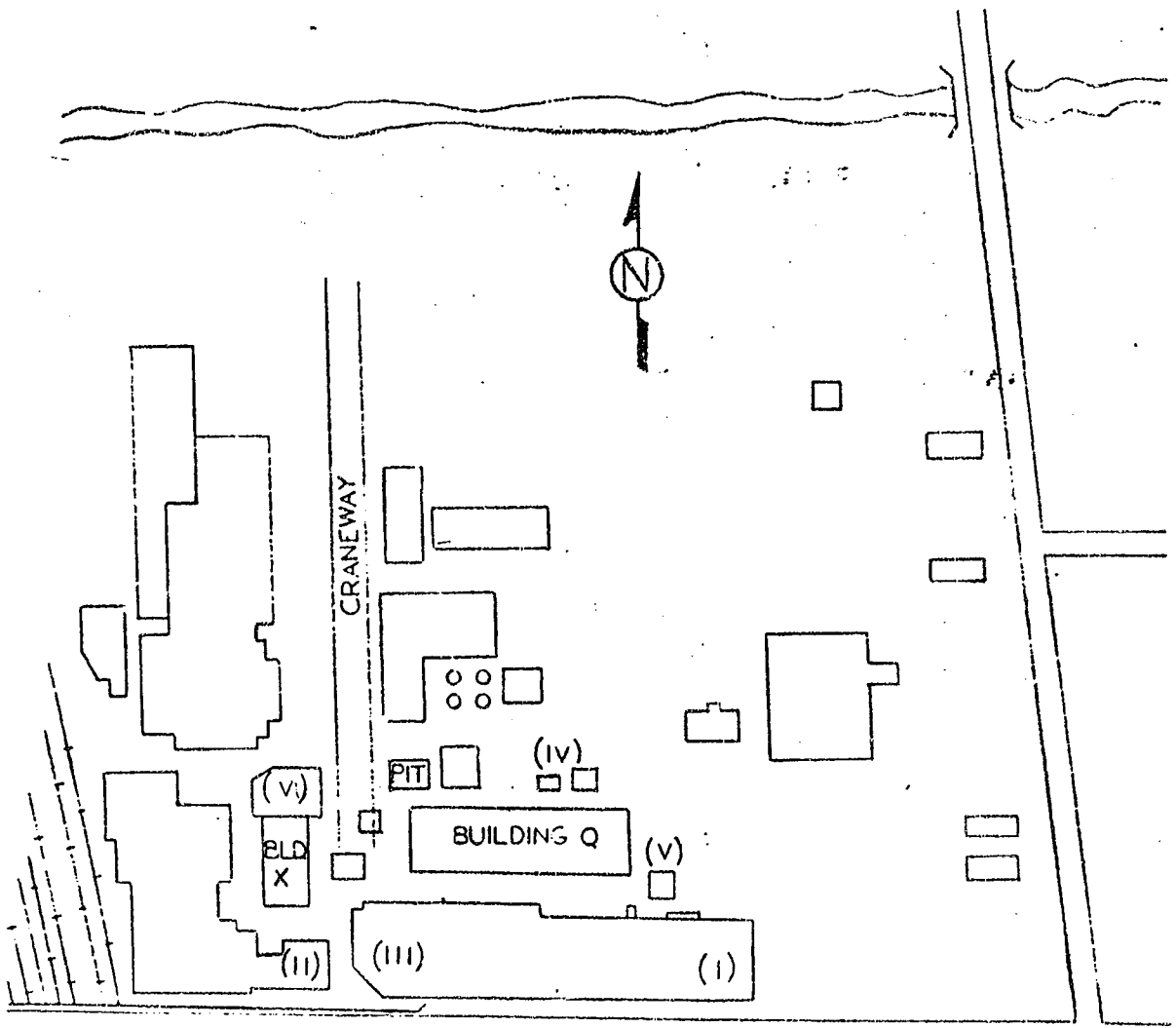
MODERN DROP FORGE COMPANY

By:

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EXHIBIT B
MODERN DROP FORGE COMPANY
SITE PLAN LAYOUT

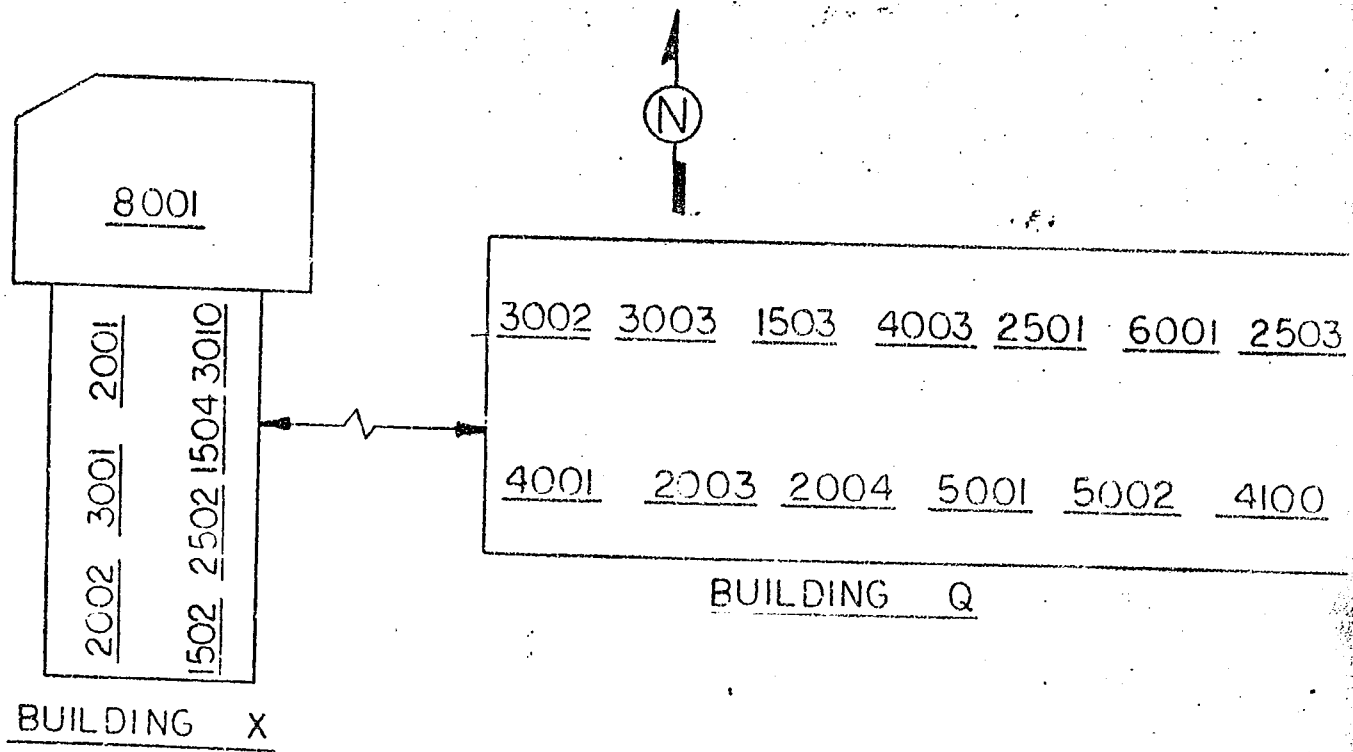


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SCALE 1/2" = 100' - 0"

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EXHIBIT C
MODERN DROP FORGE COMPANY
LOCATION OF FORGING HAMMER UNITS

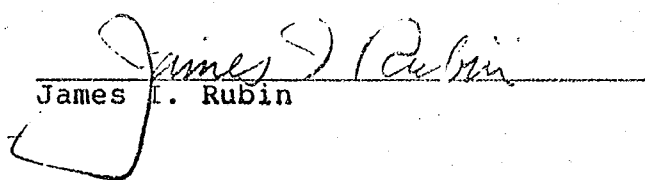


SCALE 1" = 50'-0"

HAMMER SHOP LAYOUT

CERTIFICATE OF SERVICE

James I. Rubin, an attorney, deposes and states that he served the foregoing Petition For A Site Specific Operational Level on the Illinois Environmental Protection Agency by depositing a true and correct copy of same in the U.S. Mail at Three First National Plaza, Chicago, Illinois, proper postage prepaid for Certified Mail, Return Receipt Requested, addressed to 2200 Churchill Road, Springfield, Illinois 62706 on November 3, 1982.


James I. Rubin