NEW YORK STATE OF OPPORTUNITY. | Division of Licensing Services

EGZIJANS POU AYERASYON POU SÈVIS ESPESYALITE NAN ZONG
DOKIMAN GID POU KONTRAKTÈ AK PWOFESYONÈL KONSEPSYON

KONTAKTE DEPATMAN-DETA

Si ou gen nenpòt kesyon sou egzijans pou ayerasyon oswa sou fason pou konfòme ou avèk biznis ou, tanpri kontakte Depatman-Deta nan nimewo ***518-474-4429***. Ou kapab jwenn enfòmasyon ak resous siplemantè sou sitwèb nou (www.dos.ny.gov).

Entwodiksyon

Depatman-Deta Eta New York, adopte yon nouvo règleman ki egzije tout biznis ki ofri sèvis maniki ak pediki pou yo enstale ayerasyon ki respekte estanda ayerasyon mekanik pou salon bote ki te resevwa kontravansyon dapre Kòd Mekanik Entènasyonal 2015 (2015 International Mechanical Code, "2015 IMC"). Nou mete yon kopi dispozisyon enpòtan 2015 IMC nan Apandis A. Estanda sa yo entwodui nan Kòd Inifòm Eta New York pou Prevansyon Dife ak pou Konstwiksyon (New York State Uniform Fire Prevention and Building Code). Règleman yo egzije pou tout biznis ki la deja epi ki ofri sèvis maniki ak pediki pou yo satisfè estanda ayerasyon yo anvan ane 2021. Tout nouvo biznis ki aplike pou yon lisans nan dat 3 oktòb 2016 oswa apre dat sa a, ap bezwen konfòme yo avèk menm egzijans yo nan moman biznis lan louvri.

Estanda ayerasyon an egzije pou biznis yo bay ase ayerasyon, tankou lè deyò ak lè rejè, yon fason pou kontaminan nuizib yo, vapè yo ak patikil yo kapab degaje lwen kliyan yo ak travayè yo. Règleman yo egzije tou pou biznis yo gen yon sistèm degajman lokal (ki vle di sistèm kaptaj nan sous) nan chak estasyon maniki ak pediki pou retire sibstans nuizib nan sous yo.

Dokiman sa a la ap sèvi pou bay kontraktè yo ak pwofesyonèl konsepsyon yo ase enfòmasyon pou yo ofri, konsevwa ak enstale kòrèkteman yon sistèm ki satisfè kondisyon ayerasyon yo jwenn nan règleman yo ak nan 2015 IMC. Egzanp plan ki respekte egzijans 2015 IMC endike nan Apandis B.

Ou ka kontakte Depatman-Deta pou nenpòt kesyon nan nimewo ***518-474-4429***.

Dispozisyon yo konsènan Ayerasyon

Egzijans Kòd Mekanik 2015

Kòd Mekanik Entènasyonal 2015 egzije pou gen ayerasyon jeneral (lè fre ak lè rejè) pou salon maniki ak sèten egzijans konsènan degajman lokal (sistèm kaptaj nan sous) pou chak estasyon pediki ak maniki.

Sikilasyon lè deyò a (lè fre) ki obligatwa dapre 2015 IMC pral depannde yon kantite faktè, tankou men pa sèlman; kantite moun ki nan salon bote a, gwosè salon bote a, gwosè kanalizasyon ayerasyon yo, kalite sistèm nan, efikasite sistèm distribisyon lè a ak kantite kontaminan nan kote kliyan yo ak travayè yo ye. Detay sa yo p ap menm selon yon salon bote ak yon lòt.

Etap pou Konfòmite (Lòt detay sou chak etap pou swiv):

Etap 1: Evalye sistèm ayerasyon ki la deja epi detèmine kapasite ki la deja ak debi lè a
Etap 2: Detèmine chanjman ki pral nesesè yo pou satisfè nouvo ayerasyon ak debi ekstraksyon yo
Etap 3: Detèmine pi bon chwa a pou kalite sistèm degajman lokal yo (sistèm kaptaj nan sous) ki dwe itilize
Etap 4: Detèmine pi bon chwa jeneral yo pou salon bote a

Etap 1: Evalyasyon Sistèm Ayerasyon ki La Deja

Premye etap pou detèmine ki travay ki obligatwa pou fè sistèm ki la deja konfòme li se fè yon evalyasyon sistèm ki la deja a. Yon evalyasyon ap gen ladan toudabò kapasite ayerasyon ak sistèm degajman ki la deja. Etap sa a ap detèmine kantite lè k ap bouje nan moman an andedan sistèm ki la deja tankou, kantite lè deyò (lè fre), kantite lè ki retounen ak kantite lè rejè. Ou kapab reyalize sa depi ou revize plan rekòlman, jwenn rapò balansman lè ki la deja, oswa pran lekti lè sistèm ki la deja yo. Lè ou detèmine kapasite sistèm ki la deja a, w ap detèmine nouvo egzijans yo.

Etap 2: Detèmine egzijans yo pou Ayerasyon ak Degajman:

Anvan nou dekri Etap 2, men kèk tèm ki enpòtan:

Definisyon:

SALON MANIKI. *Vle di bilding, oswa pòsyon nan yon bilding, kote yo ofri oswa bay sèvis espesyalite nan zong.*

SISTÈM KAPTAJ NAN SOUS. *Yon sistèm degajman mekanik yo konsevwa ak konstwi pou kapte kontaminan lè nan sous yo epi pou degaje kontaminan sa yo nan atmosfè deyò a.*

Kondisyon yo:

1. **Egzijans pou ayerasyon:** Yon sistèm ayerasyon ki bay ekoulman lè deyò ak lè rejè nan yon ritm ki pa mwens pase *pi gwo*:

    a) estanda ayerasyon pou salon maniki jan sa endike nan Seksyon 401 ak 403 2015 IMC, oswa
    b) 50 pye kib pa minit pou chak estasyon maniki ak pediki nan salon maniki a

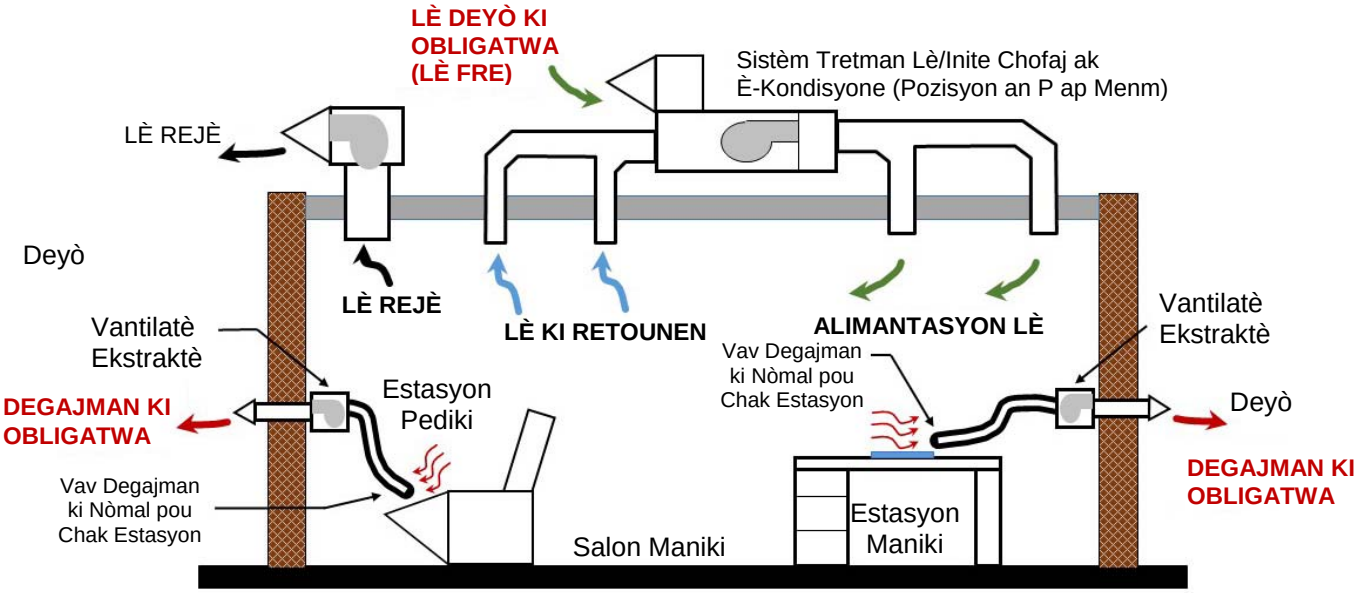
2. **Egzijans degajman espesyal:** Yon sistèm degajman lokal (sistèm kaptaj nan sou) ki gen omwen yon vav, ki kapab degaje omwen 50cfm, nan chak estasyon maniki ak pediki. Chak vav degajman ta dwe:
    a) enstale nan izin nan, epi se fabrikan an estasyon maniki ak pediki a ki dwe enstale li; oswa
    b) enstale anplas nan yon kote ki pa pi plis pase 12 pous sou plan orizontal epi pa pi plis pase 12 pous sou plan vètikal apati pwen aplikasyon sibstans chimik lan oswa kote yo mete zong kliyan an lè y ap bay sèvis espesyalite nan zong.

    Ritm degajman nan sistèm sa yo dwe fasilite yo aplike ekoulman degajman an ki obligatwa dapre Tablo 403.3.1.1 2015 IMC. Tanpri gade egzanp ki anba la yo sou fason sistèm degajman lokal la (sistèm kaptaj nan sous) sèvis yon estasyon maniki ak pediki.

3. **Sistèm Ayerasyon ak Degajman Ekilibre.** Ekilibre nan yon mannyè pou bay lè deyò nan yon ritm ki egal a ritm degajman an;

4. **Operasyon sistèm nan:** Sistèm nan dwe opere toutan lè gen nenpòt moun oswa kèk moun nan salon maniki pediki a.

Anba la a se chema yon sistèm ayerasyon jeneral ki montre diferan eleman ki travay ansanm kòm yon sistèm ayerasyon konplè ki sèvi yon salon maniki.



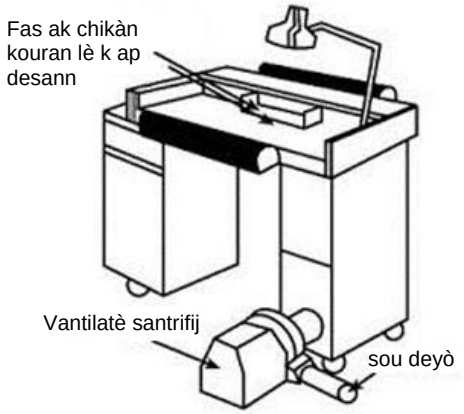
Modèl Sistèm Ayerasyon

Etap 3: Detèmine pi bon chwa a pou kalite Sistèm Degajman Lokal yo (Sistèm Kaptaj nan Sous) ki dwe itilize nan chak estasyon pediki ak maniki
Selon plan estasyon maniki yo ki nan salon bote a, ekspozisyon miray andedan, ak sistèm degajman ki la deja, ka gen anpil chwa ki disponib pou konfòme ou avèk egzijans degajman lokal yo.

Men kèk chwa Sistèm Degajman Lokal (Sistèm Kaptaj nan Sous):

1. Yon nouvo estasyon maniki ki gen ayerasyon izin nan enstale; oswa
2. Yon estasyon maniki ki la deja epi ki gen yon vav degajman ki enstale anplas; oswa
3. Yon sistèm degajman lokal ki enstale anplas yo itilize avèk yon tab modifye ki la deja; oswa
4. Yon sistèm kaptaj nan sous endepandan ou achte kòm yon diplis nan yon estasyon.

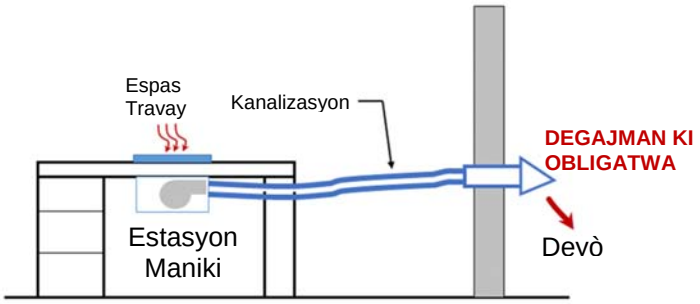
Nan chak nan chwa ki endike anwo a, sistèm degajman lokal yo dwe degaje sou deyò swa apa oswa gwoupe ansanm nan yon degajman komen.



Modèl Estasyon Maniki ki gen Degajman Lokal izin nan enstale (Sistèm Kaptaj nan Sous)

Nouvo Estasyon Maniki ki Gen Ayerasyon Enstale

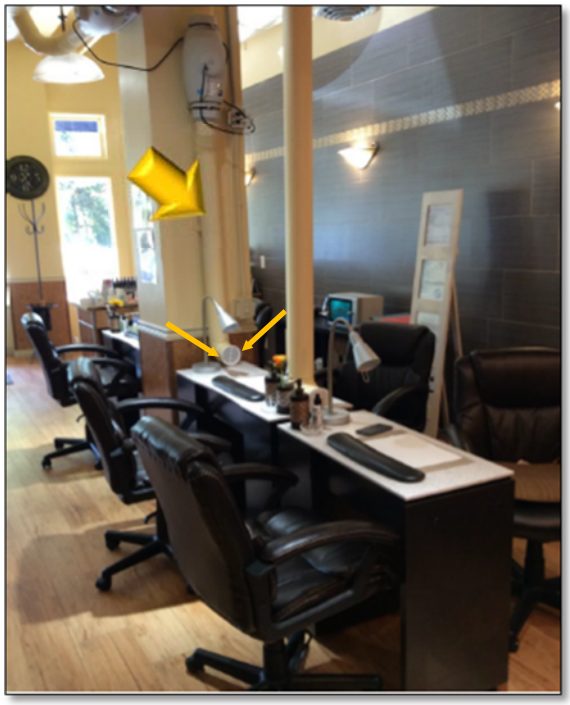
Yon tab ki ayere se yon tab ki gen yon vantilatè ki rale vapè ak patikil chimik yo nan yon kanalizasyon epi anpeche yo antre nan atmosfè sal la. Yon tab ki ayere se yon egzanp degajman lokal paske li anpeche sibstans chimik toksik rive nan zòn respirasyon travayè maniki yo ak kliyan yo. Tab ki ayere a dwe konsevwa pou voye lè ki kontamine a deyò, men pa andedan salon bote a.

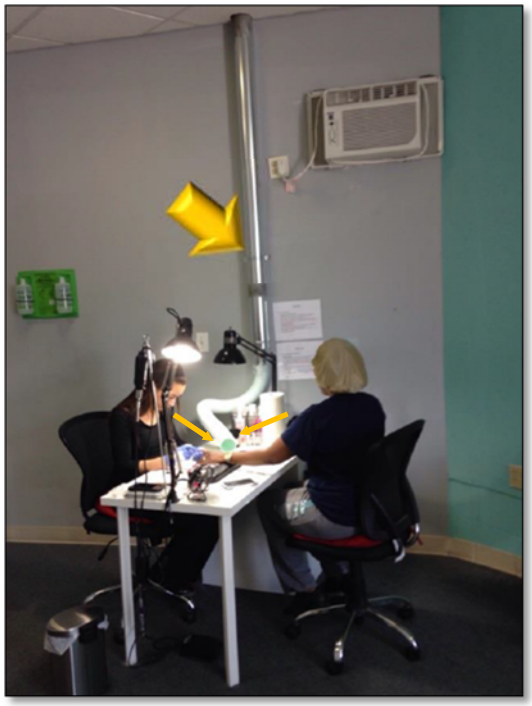


Estasyon Ayere ki Gen Vantilatè Enstriktè

Estasyon Maniki ki la deja epi ki gen yon Vav Degajman ki enstale Anplas

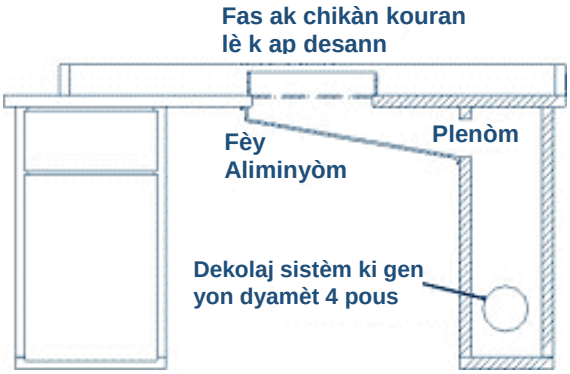
Yon kiv fiks oswa mobil ki konekte avèk yon kanalizasyon degajman se yon modèl sistèm degajman lokal (sistèm kaptaj nan sous). Ou kapab mete yon kiv mobil nan chak estasyon sou zong yo (men oswa pye) k ap resevwa sèvis la, epi l ap kapte vapè chimik yo nan sous yo pou degaje yo sou deyò.





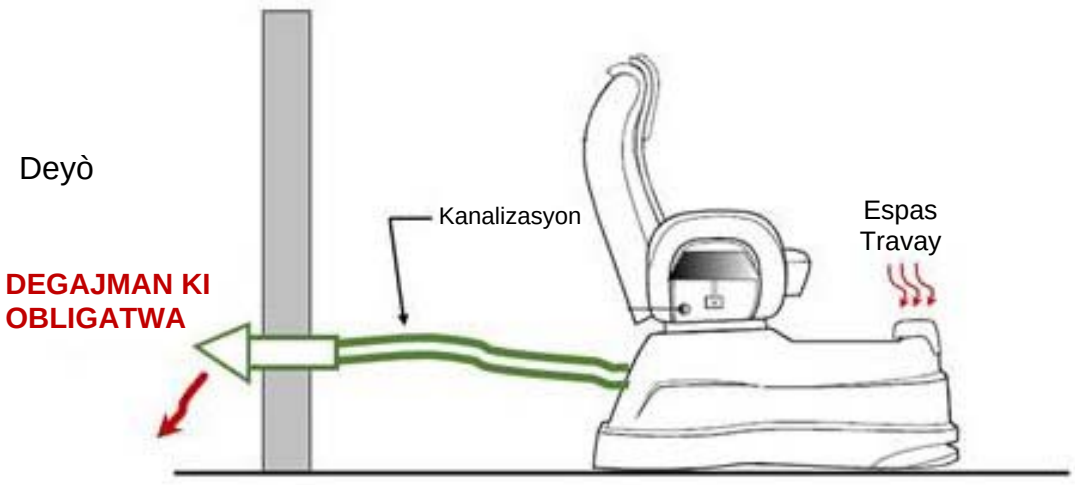
Modifikasyon yon Tab ki La Deja

Pou chanje yon tab kote yon kliyan ye deja pou mete li nan yon tab ki ayere, fè yon penetrasyon nan anlè tab la pou kite lè (antre ki rele fas kouran lè k ap desann). Ou ta dwe mete fas kouran lè k ap desann nan sou bò tab teknisyen an. Kouvri ouvèti a avèk yon kouvèti ki tankou yon griy (oswa plak ki gen anpil ti twou). Bò tab kliyan an ta dwe se enpe pi wo pase sou kote teknisyen an. Sa ap pèmèt men kliyan an pann sou fas kouran lè k ap desann nan epi toupre otank posib avèk ayerasyon degajman lokal la (gade Figi ki anba la a).

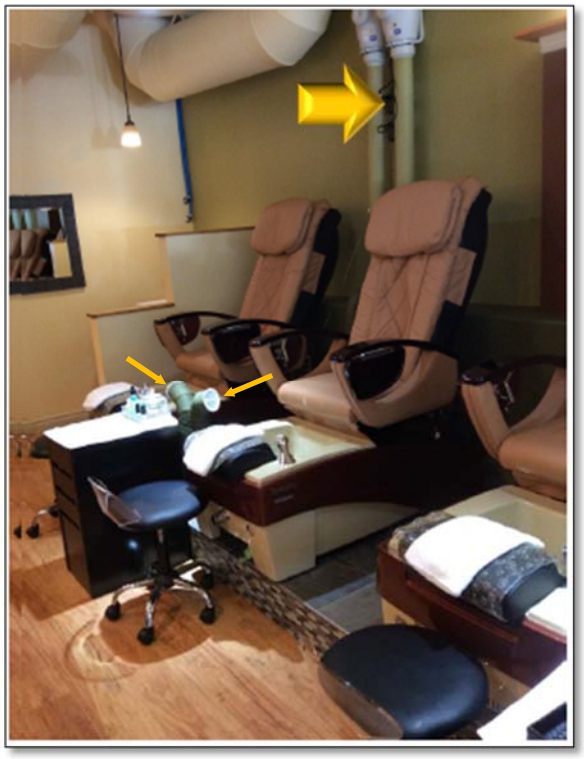


Asire omwen 50 CFM lè ap deplase nan kouran lè k ap desann nan tab la pou elimine sibstans chimik yo, men plis ka nesesè dapre konsepsyon an.

Modèl yon sistèm kaptaj nan sous (degajman lokal) pou yon estasyon pediki:



Estasyon Pediki ki Bati nan Ayerasyon ki konekte sou deyò



Estasyon Pediki ki Degajman ki Enstale Anplas

Etap 4: Detèmine pi bon chwa jeneral yo pou salon bote a.
Sistèm ayerasyon ki la deja ak konfigirasyon espas ki la deja, ansanm avèk bidjè, ap detèmine chwa ki disponib yo pou salon bote a. Men kèk lòt atik pou konsidere:

- Gwosè ak aparans kanalizasyon ak ekipman ki ekspoze
- Preferans pou ekipman andedan ak deyò
- Kòd ak estanda
- Chaj refwadisman/chofaj
- Frè eksplwatasyon
- Frè antretyen

Pi bon chwa pou salon bote a ap depannde bidjè ki disponib ak estetik ou vle yo.

Modèl Aplikasyon: (Itilizasyon Seksyon 4 ki nan 2015 IMC – Egzijans pou Ayerasyon)

Yon Salon Maniki ki gen yon sipèfisi 100 pye kare sèvi avèk yon inite tretman lè anlè twati zòn senp pou chofaj ak refwadisman avèk griy rejis nan distribisyon nan plafon ki gen kanalizasyon ak griy retou nan plafon.

Tanpri Sonje: Modèl sa a se pou yon sistèm zòn senp, epi ou dwe fè etap siplemantè pou lòt kalite sistèm yo. Tanpri gade seksyon 403 ki nan 2015 IMC.

ETAP EN: Detèmine Chaj Moun ki nan Salon Bote (P_z) pou espas la

Nan Tablo 403.3.1.1 Dansite Okipan pou yon salon maniki se 25 moun pou chak 1000 sf.

P_z = 1000 ft^2 x 25 = 25 okipan

ETAP DE: Detèmine Ekoulman Lè Deyò pou Zòn Respirasyon an (V_{bz})

$$V_{bz} = R_pP_z + R_aA_z$$ (Ekwasyon 4-1)

Ki kote:
Az = Sipèfisi planche zòn: sipèfisi nè planche ki ka pran moun nan espas la oswa espas yo ki nan zòn nan.

Pz = Popilasyon zòn: kantite moun nan espas la oswa espas yo ki nan zòn nan.

Rp = Kantite lè deyò a pou moun yo: kantite lè k ap sikile deyò a ki nesesè pou chak moun nan Tablo 403.3.1.1.

Ra = Kantite lè deyò a pou Sipèfisi a: kantite lè k ap sikile deyò a ki nesesè pou chak inite nan Tablo 403.3.1.1.

Debi Ayerasyon Minimòm (Tablo 403.3.1.1 – 2015 IM)

Klasman Okipasyon	Dansite Okipan (#1000 FT^2)	Kantite Lè k ap Sikile Deyò a pou Moun yo nan zòn Respirasyon an R_p CFM/Moun	Kantite Lè k ap Sikile Deyò a pou Sipèfisi a nan zòn Respirasyon an R_z CFM/FT^2	Kantite Lè k ap Sikile pou Degajman CFM/FT^2
Salon Bote	25	20	0.12	0.6
Salon Maniki	25	20	0.12	0.6

Pou nòt anba paj yo ale nan 2015 IMC Tablo 403.3.1.1

Nan Tablo 403.3.1.1

Rp = 20 CFM/Moun Ra = 0.12 CFM/Pye Kare

Ou kapab rezoud ekwasyon 4-1:

$$V_{bz} = R_pP_z + R_aA_z$$

V_{bz} = (20 cfm/moun x 25 moun) + (0.12 cfm/ft^2 x 1000 Pye Kare)

V_{bz} = (500) + (120) = 620 CFM

TWAZYÈM ETAP: Detèmine Sikilasyon Lè Deyò Zòn nan (V_{oz})

$$V_{oz} = V_{bz}/E_z \qquad \textbf{Ekwasyon 4-2}$$

Ez = Efikasite Distribisyon Lè Zòn

Tablo 403.3.1.1.1.2
EFIKASITE DISTRIBISYON LÈ[a,b,c,d]

KONFIGIRASYON DISTRIBISYON LÈ	E_z
Alimantasyon lè fre nan plafon oswa planche	1.0[e]
Alimantasyon lè cho nan plafon oswa planche ak rannman planche	1.0
Alimantasyon lè cho nan plafon ak rannman plafon	0.8[f]
Alimantasyon lè cho nan planche ak rannman plafon	0.7
Lè konpansasyon ki asire nan kote opoze sal la nan degajman ak/oswa rannman	0.8
Lè konpansasyon ki aspire toupre pozisyon degajman ak/oswa rannman	0.5

Pou SI: 1 pye = 304.8 mm, 1 pye pa minit = 0.00506 m/s,
°C = [(°F) – 32]/1.8.

a. "Lè frèt" se lè ki pi frèt pase tanperati espas la.
b. "Lè cho" se lè ki pi cho pase tanperati espas la.
c. "Plafon" gen ladan nenpòt pwen ki anlè zòn respirasyon an.
d. "Planche" gen ladan nenpòt pwen ki anba zòn respirasyon an.
e. Efikasite distribisyon lè zòn 1.2 dwe fasil pou sistèm ki gem alimantasyon lè frèt nan planche a ak rannman plafon, depi ayerasyon deplasman velosite ba reyalize sikilasyon lè nan yon sèl direksyon ak estratifikasyon tèmik.
f. Efikasite distribisyon lè nan zòn 1.0 dwe fasil pou sistèm ki gen rannman lè cho nan plafon, depi tanperati lè alimantasyon an pi piti pase 15°F anwo tanperati espas la epi depi jè lè alimantasyon a rive nan limit 4½ pye nivo planche a.

Nan Ekwasyon 4 -2:

Voz = Vbz/Ez

Nan etap anvan an: V_{oz} = 620 cfm

Nan Tablo 403.1.1.1.2 (Dapre alimantasyon lè plafon an rannman plafon)
Mòd Refwadisman: E_z = 1.0 V_{oz} = 620 CFM
Mòd Chofaj: E_z = 0.8 V_{oz} = 775 CFM

Kantite Lè Deyò ki Obligatwa:

$V_{ot} = V_{oz}$ = 775 CFM

Nan pifò ka yo, lè deyò ki obligatwa a ap reprezante faktè desizyon an anrapò avèk ekilib sistèm nan. Sizoka kantite lè rejè a pi gwo pase kantite lè deyò ki obligatwa a, kantite sa a ta dwe ajiste pou kreye yon sistèm ki ekilibre. Nan ka sa a, ta gen apeprè 16 tab (a cfm yo chak =) nan espas pou gen debi ekstraksyon ki depase kantite lè deyò ki obligatwa a. Si sa se te ka yo, kantite lè deyò a ta dwe ogmante.

Detèmine kantite estasyon nan Salon Bote a:

8 Estasyon Maniki ak 2 Estasyon Pediki

Degajman ki Obligatwa = 10 estasyon x 50 cfm = 500 CFM Degajman

Chak degajman ka kanalize apa oswa melanje avèk lòt degajman yo epi kanalize sou deyò. Pou sistèm ki la deja, evalyasyon an ta dwe detèmine si lè deyò ki la deja a apwopriye epi si degajman jeneral ki la deja dwe ajiste oswa modifye poutèt sa.

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Tcheke Lis pou Enjenyè / Kontraktè Mekanik yo:

Evalyasyon Sistèm ki la deja

- ☐ 1. Sipèfisi planche Salon Bote (sipèfisi an pye kare- SF) _____
  - ☐ 1a. Kantite lè rejè ki la deja (cfm) nan salon bote a _____
  - ☐ 1b. Kantite lè (fre) deyò ki la deja (cfm) nan salon bote a _____
  - ☐ 1c. Kantite Estasyon Pediki ak Maniki _____

Ayerasyon ki obligatwa ak debi ekstraksyon yo

- ☐ 2. Kantite lè deyò Zòn Respirasyon ki kalkile _____(V_{bz})
  - ☐ 2a. Efikasite Distribisyon Zòn (Ez; Tablo x) _____
  - ☐ 2b. Kantite lè Deyò ki Kalkile (Voz; Ekwasyon x) _____
  - ☐ 2c. Sistèm Zòn Senp nan Salon Bote (Vot = Voz) _____
  - ☐ 2d. Si Anpil Zòn oswa 100% Lè Deyò – Ale nan Seksyon 2015 IMC
  - ☐ 2e. Degajman total ki obligatwa pou estasyon maniki ak pediki yo (Atik (1c) x 50 cfm) _____
- ☐ 3. Si li obligatwa, kantite lè deyò a modere
- ☐ 4. Konsepsyon an konfòm avèk tout Kòd Lokal, Kòd Leta ak Kòd Federal ki anvigè.
- ☐ 5. Konfime konsepsyon sistèm ki rekòmande a konsidere tout estasyon travay maniki ak pediki yo
- ☐ 6. Asire konsepsyon sistèm ki rekòmande a, lè l ap fonksyone, pa depase nivo bwi 5 Sòn (51 dBa) ki sijere pou estasyon travay la

Règleman yo

Nan ka yon salon maniki, yon sistèm ayerasyon mekanik ki konfòm avèk “Kòd Mekanik Entènasyonal 2015” (Dat Piblikasyon an: 30 Me 2014, Twazyèm Enpresyon), International Code Council, Inc. pibliye, epi selon modifikasyon Sipleman Kòd Inifòm 2016 Estanda ak Kòd Konstwiksyon Eta New York (NYS Building Standards and Codes 2016 Uniform Code Supplement) fè (ki endike annapre kòm “2015 IMC”) tankou li:

(i) gen kapasite pou bay sikilasyon deyò nan yon ritm ki pa pi piti pase **pi gwo**

(a) estanda ayerasyon pou salon maniki jan sa endike nan Seksyon 401 ak 403 2015 IMC, oswa

(b) 50 pye kib pa minit pou chak estasyon maniki ak pediki nan salon maniki a

(ii) gen ladan yon sistèm degajman mekanik ki:

(a) konsevwa ak konstwi pou kapte tout vapè chimik, gaz, pousyè ak lòt kontaminan lè nan sous yo, epi pou degaje kontaminan sa yo nan atmosfè deyò a;

(b) gen omwen yon vav degajman pou chak estasyon maniki ak pediki (se fabrikan estasyon maniki oswa pediki a ki dwe enstale chak vav degajman oswa chak vav degajman dwe enstale anplas nan yon kote ki pa mezire pi plis pase 12 pous sou plan orizontal epi ki pa mezire pi plis pase 12 pous sou plan vètikal apati pwen aplikasyon chimik oswa kote travayè yo mete zong kliyan yo lè y ap bay yon sèvis espesyalite nan zong);

(c) gen kapasite pou degaje nan salon maniki a nan yon ritm ki pa piti pase pi gwo (1) estanda ayerasyon pou salon maniki yo jan sa endike nan Seksyon 401 ak 403 ki nan 2015 IMC oswa (2) 50 pye kib pa minit pou chak estasyon maniki nan salon maniki a;

(d) degaje tout lè rejè ki soti nan salon maniki a (tankou men pa sèlman tout vapè chimik ak gaz, pousyè, ak lòt kontaminan lè ak odè ki pwodui oswa soti nan sèvis espesyalite zong) nan atmosfè deyò a, avèk chak dechaj degajman ki nan yon pwen kote li p ap lakòz yon deranjman pou lòt moun yo epitou kote lè ki degaje a (tankou men pa sèlman vapè chimik ak gaz, pousyè, ak lòt kontaminan lè ak odè) pa kapab aspire fasil nan eleman lè ki antre sistèm ayerasyon an; epi

(e) degaje tout lè rejè ki soti nan salon maniki a (tankou men pa sèlman tout vapè chimik ak gaz, pousyè, ak lòt kontaminan lè ak odè ki pwodui oswa soti nan sèvis espesyalite zong) nan yon mannyè ki asire pa gen pati nan lè degajman an ki dwe re-sikile nan salon maniki a oswa nan nenpòt lòt espas ki nan bilding nan, oswa ki transfere nan nenpòt lòt espas ki nan bilding nan;

(iii) ekilibre nan yon mannyè pou bay lè deyò nan yon ritm ki egal a ritm degajman an; epi

(iv) opere nan oswa anwo ritm sikilasyon alimantasyon lè deyò minimòm ki endike nan sou-paragraf (i) paragraf sa a ak nan oswa anwo debi ekstraksyon minimòm ki endike nan kondisyon (c) sou-paragraf (ii) paragraf sa a toutan lè salon maniki a gen nenpòt moun oswa kèk moun ladan.

(C) Pa gen estanda oswa egzijans ki endike nan paragraf (6) sou-divizyon (b) seksyon sa a ki dwe konsidere kòm estanda oswa egzijans ki ranplase, modifye oswa afekte nenpòt estanda oswa egzijans siperyè oswa ki gen plis restriksyon ki anvigè pou aktivite amelyorasyon aparans ak/oswa pou bilding yo. Si ou pa konfòme ou avèk estanda oswa egzijans siperyè oswa ki gen plis restriksyon sa ka yon vyolasyon lòt lwa oswa règleman ki anvigè, tankou, jan sitiyasyon an ka ye, Kòd Inifòm Leta pou Prevansyon Dife ak pou Konstwiksyon, Kòd Konstwiksyon Vil New York (New York City Construction Code), lòt kòd konstwiksyon, Kòd Endistriyèl Leta (State Industrial Code) oswa estanda anviwònman.

Appendix A

2015 IMC

floor area of the interior room or space, but not less than 20 square feet (1.86 m^2). The minimum openable area to the outdoors shall be based on the total floor area being ventilated.

[BG] 402.4 Openings below grade. Where openings below grade provide required *natural ventilation*, the outside horizontal clear space measured perpendicular to the opening shall be one and one-half times the depth of the opening. The depth of the opening shall be measured from the average adjoining ground level to the bottom of the opening.

SECTION 403
MECHANICAL VENTILATION

403.1 Ventilation system. Mechanical ventilation shall be provided by a method of supply air and return or *exhaust air* except that mechanical ventilation air requirements for Group R-2, R-3 and R-4 occupancies three stories and less in height above grade plane shall be provided by an exhaust system, supply system or combination thereof. The amount of supply air shall be approximately equal to the amount of return and *exhaust air*. The system shall not be prohibited from producing negative or positive pressure. The system to convey *ventilation air* shall be designed and installed in accordance with Chapter 6.

403.2 Outdoor air required. The minimum outdoor airflow rate shall be determined in accordance with Section 403.3.

Exception: Where the *registered design professional* demonstrates that an engineered ventilation system design will prevent the maximum concentration of contaminants from exceeding that obtainable by the rate of outdoor air ventilation determined in accordance with Section 403.3, the minimum required rate of outdoor air shall be reduced in accordance with such engineered system design.

403.2.1 Recirculation of air. The outdoor air required by Section 403.3 shall not be recirculated. Air in excess of that required by Section 403.3 shall not be prohibited from being recirculated as a component of supply air to building spaces, except that:

1. Ventilation air shall not be recirculated from one *dwelling* to another or to dissimilar occupancies.
2. Supply air to a swimming pool and associated deck areas shall not be recirculated unless such air is dehumidified to maintain the relative humidity of the area at 60 percent or less. Air from this area shall not be recirculated to other spaces where more than 10 percent of the resulting supply airstream consists of air recirculated from these spaces.
3. Where mechanical exhaust is required by Note b in Table 403.3.1.1, recirculation of air from such spaces shall be prohibited. Recirculation of air that is contained completely within such spaces shall not be prohibited. Where recirculation of air is prohibited, all air supplied to such spaces shall be exhausted, including any air in excess of that required by Table 403.3.1.1.
4. Where mechanical exhaust is required by Note g in Table 403.3.1.1, mechanical exhaust is required and recirculation from such spaces is prohibited where more than 10 percent of the resulting supply airstream consists of air recirculated from these spaces. Recirculation of air that is contained completely within such spaces shall not be prohibited.

403.2.2 Transfer air. Except where recirculation from such spaces is prohibited by Table 403.3.1.1, air transferred from occupiable spaces is not prohibited from serving as *makeup air* for required exhaust systems in such spaces as kitchens, baths, toilet rooms, elevators and smoking lounges. The amount of transfer air and *exhaust air* shall be sufficient to provide the flow rates as specified in Section 403.3.1.1. The required outdoor airflow rates specified in Table 403.3.1.1 shall be introduced directly into such spaces or into the occupied spaces from which air is transferred or a combination of both.

403.3 Outdoor air and local exhaust airflow rates. Group R-2, R-3 and R-4 occupancies three stories and less in height above grade plane shall be provided with outdoor air and local exhaust in accordance with Section 403.3.2. All other buildings intended to be occupied shall be provided with outdoor air and local exhaust in accordance with Section 403.3.1.

403.3.1 Other buildings intended to be occupied. The design of local exhaust systems and ventilation systems for outdoor air for occupancies other than Group R-2, R-3 and R-4 three stories and less above grade plane shall comply with Sections 403.3.1.1 through 403.3.1.5.

403.3.1.1 Outdoor airflow rate. Ventilation systems shall be designed to have the capacity to supply the minimum outdoor airflow rate, determined in accordance with this section. In each occupiable space, the ventilation system shall be designed to deliver the required rate of outdoor airflow to the *breathing zone*. The occupant load utilized for design of the ventilation system shall be not less than the number determined from the estimated maximum occupant load rate indicated in Table 403.3.1.1. Ventilation rates for occupancies not represented in Table 403.3.1.1 shall be those for a listed *occupancy* classification that is most similar in terms of occupant density, activities and building construction; or shall be determined by an *approved* engineering analysis. The ventilation system shall be designed to supply the required rate of *ventilation air* continuously during the period the building is occupied, except as otherwise stated in other provisions of the code.

With the exception of smoking lounges, the ventilation rates in Table 403.3.1.1 are based on the absence of smoking in occupiable spaces. Where smoking is anticipated in a space other than a smoking lounge, the

ventilation system serving the space shall be designed to provide ventilation over and above that required by Table 403.3.1.1 in accordance with accepted engineering practice.

Exception: The occupant load is not required to be determined based on the estimated maximum occupant load rate indicated in Table 403.3.1.1 where *approved* statistical data document the accuracy of an alternate anticipated occupant density.

403.3.1.1.1 Zone outdoor airflow. The minimum outdoor airflow required to be supplied to each zone shall be determined as a function of *occupancy* classification and space air distribution effectiveness in accordance with Sections 403.3.1.1.1.1 through 403.3.1.1.1.3.

403.3.1.1.1.1 Breathing zone outdoor airflow. The outdoor airflow rate required in the *breathing zone* (V_{bz}) of the *occupiable space* or spaces in a zone shall be determined in accordance with Equation 4-1.

$$V_{bz} = R_p P_z + R_a A_z \qquad \text{(Equation 4-1)}$$

where:

A_z = Zone floor area: the *net occupiable floor area* of the space or spaces in the zone.

P_z = Zone population: the number of people in the space or spaces in the zone.

R_p = People outdoor air rate: the outdoor airflow rate required per person from Table 403.3.1.1.

R_a = Area outdoor air rate: the outdoor airflow rate required per unit area from Table 403.3.1.1.

403.3.1.1.1.2 Zone air distribution effectiveness. The zone air distribution effectiveness (E_z) shall be determined using Table 403.3.1.1.1.2.

TABLE 403.3.1.1.1.2
ZONE AIR DISTRIBUTION EFFECTIVENESS[a,b,c,d]

AIR DISTRIBUTION CONFIGURATION	E_z
Ceiling or floor supply of cool air	1.0[e]
Ceiling or floor supply of warm air and floor return	1.0
Ceiling supply of warm air and ceiling return	0.8[f]
Floor supply of warm air and ceiling return	0.7
Makeup air drawn in on the opposite side of the room from the exhaust and/or return	0.8
Makeup air drawn in near to the exhaust and/or return location	0.5

For SI: 1 foot = 304.8 mm, 1 foot per minute = 0.00506 m/s, °C = [(°F) – 32]/1.8.

a. "Cool air" is air cooler than space temperature.
b. "Warm air" is air warmer than space temperature.
c. "Ceiling" includes any point above the breathing zone.
d. "Floor" includes any point below the breathing zone.
e. Zone air distribution effectiveness of 1.2 shall be permitted for systems with a floor supply of cool air and ceiling return, provided that low-velocity displacement ventilation achieves unidirectional flow and thermal stratification.
f. Zone air distribution effectiveness of 1.0 shall be permitted for systems with a ceiling supply of warm air, provided that supply air temperature is less than 15°F above space temperature and provided that the 150-foot-per-minute supply air jet reaches to within $4^1/_2$ feet of floor level.

403.3.1.1.1.3 Zone outdoor airflow. The zone outdoor airflow rate (V_{oz}), shall be determined in accordance with Equation 4-2.

$$V_{oz} = \frac{V_{bz}}{E_z} \qquad \text{(Equation 4-2)}$$

403.3.1.1.2 System outdoor airflow. The outdoor air required to be supplied by each ventilation system shall be determined in accordance with Sections 403.3.1.1.2.1 through 403.3.1.1.2.3 as a function of system type and zone outdoor airflow rates.

403.3.1.1.2.1 Single zone systems. Where one air handler supplies a mixture of outdoor air and recirculated return air to only one zone, the system outdoor air intake flow rate (V_{ot}) shall be determined in accordance with Equation 4-3.

$$V_{ot} = V_{oz} \qquad \text{(Equation 4-3)}$$

403.3.1.1.2.2 100-percent outdoor air systems. Where one air handler supplies only outdoor air to one or more zones, the system outdoor air intake flow rate (V_{ot}) shall be determined using Equation 4-4.

$$V_{ot} = \Sigma_{all\ zones} V_{oz} \qquad \text{(Equation 4-4)}$$

403.3.1.1.2.3 Multiple zone recirculating systems. Where one air handler supplies a mixture of outdoor air and recirculated return air to more than one zone, the system outdoor air intake flow rate (V_{ot}) shall be determined in accordance with Sections 403.3.1.1.2.3.1 through 403.3.1.1.2.3.4.

403.3.1.1.2.3.1 Primary outdoor air fraction. The primary outdoor air fraction (Z_p) shall be determined for each zone in accordance with Equation 4-5.

$$Z_p = \frac{V_{oz}}{V_{pz}} \qquad \text{(Equation 4-5)}$$

where:

V_{pz} = Primary airflow: The airflow rate supplied to the zone from the air-handling unit at which the outdoor air intake is located. It includes outdoor intake air and recirculated air from that air-handling unit but does not include air transferred or air recirculated to the zone by other means. For design purposes, V_{pz} shall be the zone design primary airflow

rate, except for zones with variable air volume supply and V_{pz} shall be the lowest expected primary airflow rate to the zone when it is fully occupied.

403.3.1.1.2.3.2 System ventilation efficiency. The system ventilation efficiency (E_v) shall be determined using Table 403.3.1.1.2.3.2 or Appendix A of ASHRAE 62.1.

TABLE 403.3.1.1.2.3.2
SYSTEM VENTILATION EFFICIENCY[a,b]

Max (Z_p)	E_v
≤ 0.15	1
≤ 0.25	0.9
≤ 0.35	0.8
≤ 0.45	0.7
≤ 0.55	0.6
≤ 0.65	0.5
≤ 0.75	0.4
> 0.75	0.3

a. *Max* (Z_p) is the largest value of Z_p calculated using Equation 4-5 among all the zones served by the system.
b. Interpolating between table values shall be permitted.

403.3.1.1.2.3.3 Uncorrected outdoor air intake. The uncorrected outdoor air intake flow rate (V_{ou}) shall be determined in accordance with Equation 4-6.

$$V_{ou} = D\Sigma_{all\ zones} R_p P_z + \Sigma_{all\ zones} R_a A_z \qquad \textbf{(Equation 4-6)}$$

where:

D = Occupant diversity: the ratio of the system population to the sum of the zone populations, determined in accordance with Equation 4-7.

$$D = \frac{P_s}{\Sigma_{all\ zones} P_z} \qquad \textbf{(Equation 4-7)}$$

where:

P_s = System population: The total number of occupants in the area served by the system. For design purposes, P_s shall be the maximum number of occupants expected to be concurrently in all zones served by the system.

403.3.1.1.2.3.4 Outdoor air intake flow rate. The outdoor air intake flow rate (V_{ot}) shall be determined in accordance with Equation 4-8.

$$V_{ot} = \frac{V_{ou}}{E_v} \qquad \textbf{(Equation 4-8)}$$

403.3.1.2 Exhaust ventilation. Exhaust airflow rate shall be provided in accordance with the requirements of Table 403.3.1.1. Outdoor air introduced into a space by an exhaust system shall be considered as contributing to the outdoor airflow required by Table 403.3.1.1.

403.3.1.3 System operation. The minimum flow rate of outdoor air that the ventilation system must be capable of supplying during its operation shall be permitted to be based on the rate per person indicated in Table 403.3.1.1 and the actual number of occupants present.

403.3.1.4 Variable air volume system control. Variable air volume air distribution systems, other than those designed to supply only 100-percent outdoor air, shall be provided with controls to regulate the flow of outdoor air. Such control system shall be designed to maintain the flow rate of outdoor air at a rate of not less than that required by Section 403.3 over the entire range of supply air operating rates.

403.3.1.5 Balancing. The *ventilation* air distribution system shall be provided with means to adjust the system to achieve not less than the minimum ventilation airflow rate as required by Sections 403.3 and 403.3.1.2. Ventilation systems shall be balanced by an *approved* method. Such balancing shall verify that the ventilation system is capable of supplying and exhausting the airflow rates required by Sections 403.3 and 403.3.1.2.

403.3.2 Group R-2, R-3 and R-4 occupancies, three stories and less. The design of local exhaust systems and ventilation systems for outdoor air in Group R-2, R-3 and R-4 occupancies three stories and less in height above grade plane shall comply with Sections 403.3.2.1 through 403.3.2.3.

403.3.2.1 Outdoor air for dwelling units. An outdoor air ventilation system consisting of a mechanical exhaust system, supply system or combination thereof shall be installed for each dwelling unit. Local exhaust or supply systems, including outdoor air ducts connected to the return side of an air handler, are permitted to serve as such a system. The outdoor air ventilation system shall be designed to provide the required rate of outdoor air continuously during the period that the building is occupied. The minimum continuous outdoor airflow rate shall be determined in accordance with Equation 4-9.

$$Q_{OA} = 0.01 A_{floor} + 7.5(N_{br} + 1) \qquad \textbf{(Equation 4-9)}$$

where:

Q_{OA} = outdoor airflow rate, cfm

A_{floor} = floor area, ft^2

N_{br} = number of bedrooms; not to be less than one

Exception: The outdoor air ventilation system is not required to operate continuously where the system has controls that enable operation for not less than 1 hour of each 4-hour period. The average outdoor air flow rate over the 4-hour period shall be not less than that prescribed by Equation 4-9.

VENTILATION

TABLE 403.3.1.1—continued
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT²[a]	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT²[a]	EXHAUST AIRFLOW RATE CFM/FT²[a]
Specialty shops				
Automotive motor-fuel dispensing stations[b]	—	—	—	1.5
Barber	25	7.5	0.06	0.5
Beauty salons[b]	25	20	0.12	0.6
Nail salons [b, h]	25	20	0.12	0.6
Embalming room[b]	—	—	—	2.0
Pet shops (animal areas)[b]	10	7.5	0.18	0.9
Supermarkets	8	7.5	0.06	—

For SI: 1 cubic foot per minute = 0.0004719 m³/s, 1 ton = 908 kg, 1 cubic foot per minute per square foot = 0.00508 m³/(s · m²), °C = [(°F) -32]/1.8, 1 square foot = 0.0929 m².

a. Based upon *net occupiable floor area*.
b. Mechanical exhaust required and the recirculation of air from such spaces is prohibited. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1, Item 3).
c. Spaces unheated or maintained below 50°F are not covered by these requirements unless the occupancy is continuous.
d. Ventilation systems in enclosed parking garages shall comply with Section 404.
e. Rates are per water closet or urinal. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.
f. Rates are per room unless otherwise indicated. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.
g. Mechanical exhaust is required and recirculation from such spaces is prohibited except that recirculation shall be permitted where the resulting supply airstream consists of not more than 10 percent air recirculated from these spaces. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1, Items 2 and 4).
h. For nail salons, each manicure and pedicure station shall be provided with a *source capture system* capable of exhausting not less than 50 cfm per station. Exhaust inlets shall be located in accordance with Section 502.20. Where one or more required source capture systems operate continuously during occupancy, the exhaust rate from such systems shall be permitted to be applied to the exhaust flow rate required by Table 403.3.1.1 for the nail salon.

CHAPTER 5
EXHAUST SYSTEMS

SECTION 501
GENERAL

501.1 Scope. This chapter shall govern the design, construction and installation of mechanical exhaust systems, including exhaust systems serving clothes dryers and cooking appliances; hazardous exhaust systems; dust, stock and refuse conveyor systems; subslab soil exhaust systems; smoke control systems; energy recovery ventilation systems and other systems specified in Section 502.

501.2 Independent system required. Single or combined mechanical exhaust systems for environmental air shall be independent of all other exhaust systems. Dryer exhaust shall be independent of all other systems. Type I exhaust systems shall be independent of all other exhaust systems except as provided in Section 506.3.5. Single or combined Type II exhaust systems for food-processing operations shall be independent of all other exhaust systems. Kitchen exhaust systems shall be constructed in accordance with Section 505 for domestic equipment and Sections 506 through 509 for commercial equipment.

501.3 Exhaust discharge. The air removed by every mechanical exhaust system shall be discharged outdoors at a point where it will not cause a public nuisance and not less than the distances specified in Section 501.3.1. The air shall be discharged to a location from which it cannot again be readily drawn in by a ventilating system. Air shall not be exhausted into an attic, crawl space, or be directed onto walkways.

Exceptions:

1. Whole-house ventilation-type attic fans shall be permitted to discharge into the attic space of *dwelling units* having private attics.
2. Commercial cooking recirculating systems.
3. Where installed in accordance with the manufacturer's instructions and where mechanical or *natural ventilation* is otherwise provided in accordance with Chapter 4, *listed* and *labeled* domestic ductless range hoods shall not be required to discharge to the outdoors.

501.3.1 Location of exhaust outlets. The termination point of exhaust outlets and ducts discharging to the outdoors shall be located with the following minimum distances:

1. For ducts conveying explosive or flammable vapors, fumes or dusts: 30 feet (9144 mm) from property lines; 10 feet (3048 mm) from operable openings into buildings; 6 feet (1829 mm) from exterior walls and roofs; 30 feet (9144 mm) from combustible walls and operable openings into buildings which are in the direction of the exhaust discharge; 10 feet (3048 mm) above adjoining grade.
2. For other product-conveying outlets: 10 feet (3048 mm) from the property lines; 3 feet (914 mm) from exterior walls and roofs; 10 feet (3048 mm) from operable openings into buildings; 10 feet (3048 mm) above adjoining grade.
3. For all *environmental air* exhaust: 3 feet (914 mm) from property lines; 3 feet (914 mm) from operable openings into buildings for all occupancies other than Group U, and 10 feet (3048 mm) from mechanical air intakes. Such exhaust shall not be considered hazardous or noxious.
4. Exhaust outlets serving structures in flood hazard areas shall be installed at or above the elevation required by Section 1612 of the *International Building Code* for utilities and attendant equipment.
5. For specific systems see the following sections:
   - 5.1. Clothes dryer exhaust, Section 504.4.
   - 5.2. Kitchen hoods and other kitchen exhaust *equipment*, Sections 506.3.13, 506.4 and 506.5.
   - 5.3. Dust stock and refuse conveying systems, Section 511.2.
   - 5.4. Subslab soil exhaust systems, Section 512.4.
   - 5.5. Smoke control systems, Section 513.10.3.
   - 5.6. Refrigerant discharge, Section 1105.7.
   - 5.7. Machinery room discharge, Section 1105.6.1.

501.3.2 Exhaust opening protection. Exhaust openings that terminate outdoors shall be protected with corrosion-resistant screens, louvers or grilles. Openings in screens, louvers and grilles shall be sized not less than $^1/_4$ inch (6.4 mm) and not larger than $^1/_2$ inch (12.7 mm). Openings shall be protected against local weather conditions. Louvers that protect exhaust openings in structures located in hurricane-prone regions, as defined in the *International Building Code*, shall comply with AMCA Standard 550. Outdoor openings located in exterior walls shall meet the provisions for exterior wall opening protectives in accordance with the *International Building Code*.

501.4 Pressure equalization. Mechanical exhaust systems shall be sized to remove the quantity of air required by this chapter to be exhausted. The system shall operate when air is required to be exhausted. Where mechanical exhaust is required in a room or space in other than occupancies in R-3 and *dwelling units* in R-2, such space shall be maintained with a neutral or negative pressure. If a greater quantity of air is supplied by a mechanical ventilating supply system than is removed by a mechanical exhaust for a room, adequate means shall be provided for the natural or mechanical exhaust of the excess air supplied. If only a mechanical exhaust sys-

tem is installed for a room or if a greater quantity of air is removed by a mechanical exhaust system than is supplied by a mechanical ventilating supply system for a room, adequate *makeup air* shall be provided to satisfy the deficiency.

501.5 Ducts. Where exhaust duct construction is not specified in this chapter, such construction shall comply with Chapter 6.

SECTION 502
REQUIRED SYSTEMS

502.1 General. An exhaust system shall be provided, maintained and operated as specifically required by this section and for all occupied areas where machines, vats, tanks, furnaces, forges, salamanders and other *appliances*, *equipment* and processes in such areas produce or throw off dust or particles sufficiently light to float in the air, or which emit heat, odors, fumes, spray, gas or smoke, in such quantities so as to be irritating or injurious to health or safety.

502.1.1 Exhaust location. The inlet to an exhaust system shall be located in the area of heaviest concentration of contaminants.

[F] 502.1.2 Fuel-dispensing areas. The bottom of an air inlet or exhaust opening in fuel-dispensing areas shall be located not more than 18 inches (457 mm) above the floor.

502.1.3 Equipment, appliance and service rooms. *Equipment*, *appliance* and system service rooms that house sources of odors, fumes, noxious gases, smoke, steam, dust, spray or other contaminants shall be designed and constructed so as to prevent spreading of such contaminants to other occupied parts of the building.

[F] 502.1.4 Hazardous exhaust. The mechanical exhaust of high concentrations of dust or hazardous vapors shall conform to the requirements of Section 510.

[F] 502.2 Aircraft fueling and defueling. Compartments housing piping, pumps, air eliminators, water separators, hose reels and similar *equipment* used in aircraft fueling and defueling operations shall be adequately ventilated at floor level or within the floor itself.

[F] 502.3 Battery-charging areas for powered industrial trucks and equipment. Ventilation shall be provided in an *approved* manner in battery-charging areas for powered industrial trucks and *equipment* to prevent a dangerous accumulation of flammable gases.

[F] 502.4 Stationary storage battery systems. Stationary storage battery systems, as regulated by Section 608 of the *International Fire Code*, shall be provided with ventilation in accordance with this chapter and Section 502.4.1 or 502.4.2.

Exception: Lithium-ion and lithium metal polymer batteries shall not require additional ventilation beyond that which would normally be required for human occupancy of the space.

[F] 502.4.1 Hydrogen limit in rooms. For flooded lead acid, flooded nickel cadmium and VRLA batteries, the ventilation system shall be designed to limit the maximum concentration of hydrogen to 1.0 percent of the total volume of the room.

[F] 502.4.2 Ventilation rate in rooms. Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute per square foot (cfm/ft^2) [0.00508 m^3/(s • m^2)] of floor area of the room.

[F] 502.4.3 Supervision. Mechanical ventilation systems required by Section 502.4 shall be supervised by an approved central, proprietary or remote station service or shall initiate an audible and visual signal at a constantly attended on-site location.

[F] 502.5 Valve-regulated lead-acid batteries in cabinets. Valve-regulated lead-acid (VRLA) batteries installed in cabinets, as regulated by Section 608.6.2 of the *International Fire Code*, shall be provided with ventilation in accordance with Section 502.5.1 or 502.5.2.

[F] 502.5.1 Hydrogen limit in cabinets. The cabinet ventilation system shall be designed to limit the maximum concentration of hydrogen to 1.0 percent of the total volume of the cabinet during the worst-case event of simultaneous boost charging of all batteries in the cabinet.

[F] 502.5.2 Ventilation rate in cabinets. Continuous cabinet ventilation shall be provided at a rate of not less than 1 cubic foot per minute per square foot (cfm/ft^2) [0.00508 m^3/(s • m^2)] of the floor area covered by the cabinet. The room in which the cabinet is installed shall be ventilated as required by Section 502.4.1 or 502.4.2.

[F] 502.5.3 Supervision. Mechanical ventilation systems required by Section 502.5 shall be supervised by an approved central, proprietary or remote station service or shall initiate an audible and visual signal at a constantly attended on-site location.

[F] 502.6 Dry cleaning plants. Ventilation in dry cleaning plants shall be adequate to protect employees and the public in accordance with this section and DOL 29 CFR Part 1910.1000, where applicable.

[F] 502.6.1 Type II systems. Type II dry cleaning systems shall be provided with a mechanical ventilation system that is designed to exhaust 1 cubic foot of air per minute for each square foot of floor area (1 cfm/ft^2) [0.00508 m^3/(s • m^2)] in dry cleaning rooms and in drying rooms. The ventilation system shall operate automatically when the dry cleaning *equipment* is in operation and shall have manual controls at an *approved* location.

[F] 502.6.2 Type IV and V systems. Type IV and V dry cleaning systems shall be provided with an automatically activated exhaust ventilation system to maintain an air velocity of not less than 100 feet per minute (0.51 m/s) through the loading door when the door is opened.

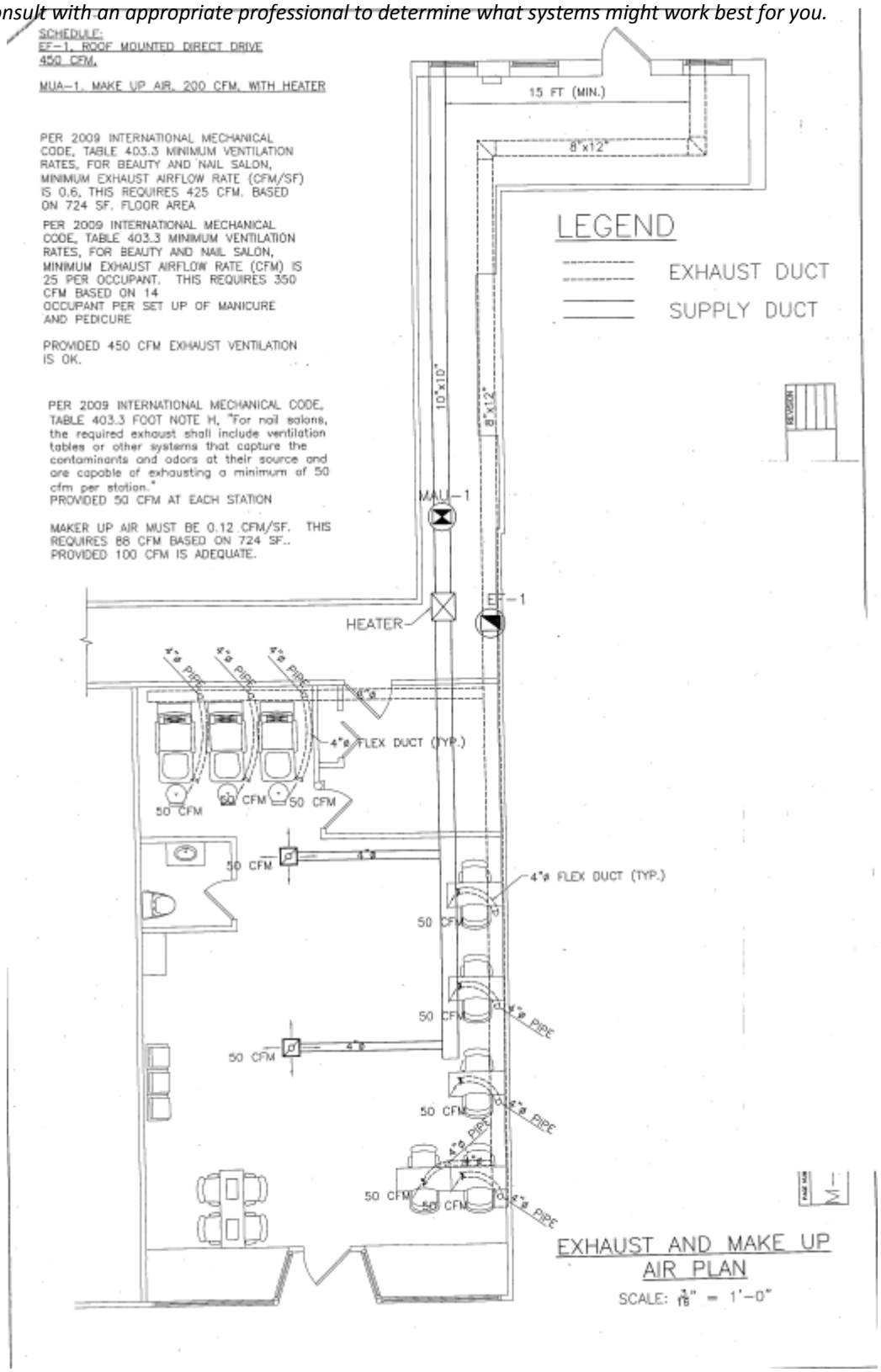
Exception: Dry cleaning units are not required to be provided with exhaust ventilation where an exhaust hood is installed immediately outside of and above the loading door which operates at an airflow rate as follows:

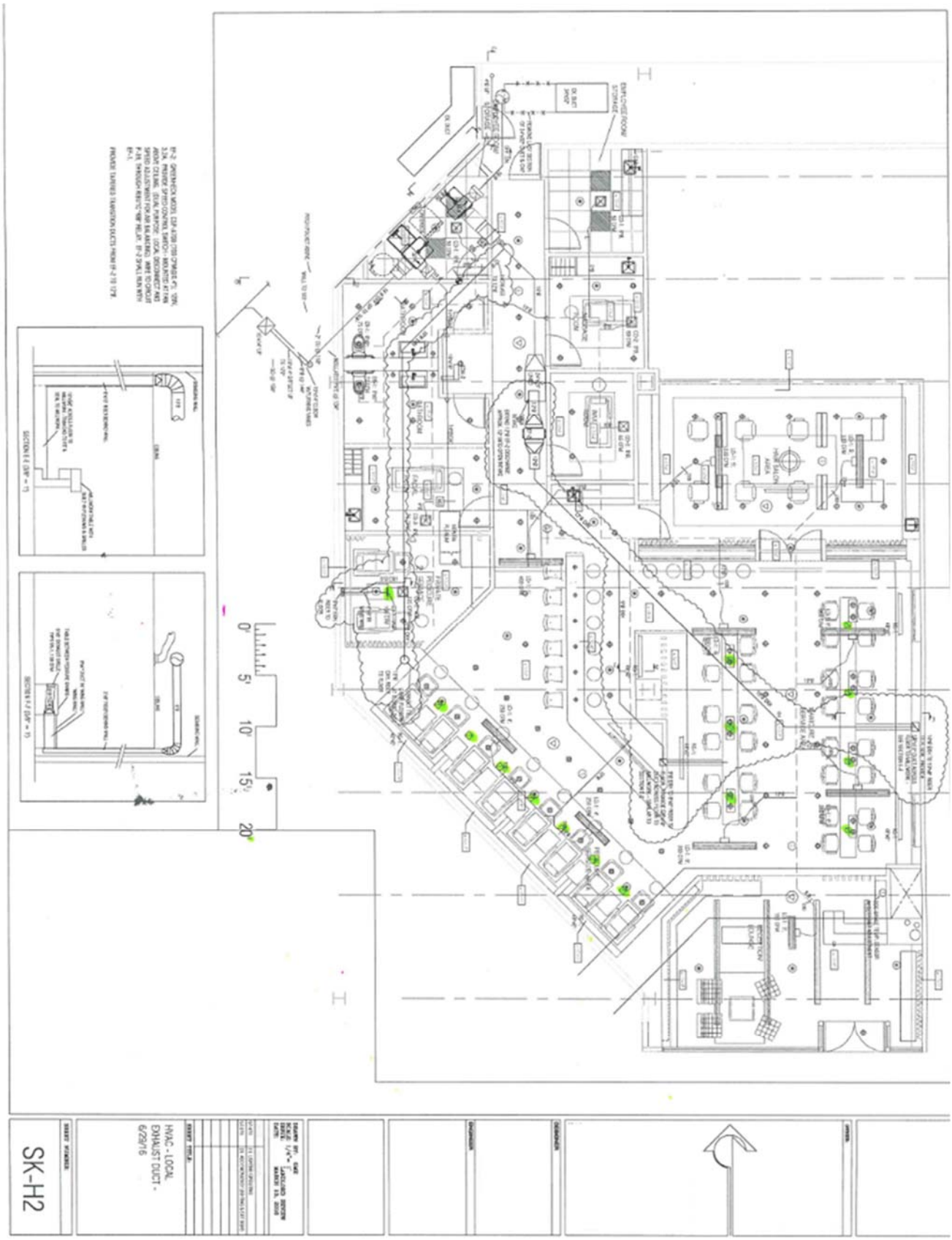
$$Q = 100 \times A_{LD} \qquad \text{Equation 5-1)}$$

502.20 Manicure and pedicure stations. Manicure and pedicure stations shall be provided with an exhaust system in accordance with Table 403.3.1.1, Note h. Manicure tables and pedicure stations not provided with factory-installed exhaust inlets shall be provided with exhaust inlets located not more than 12 inches (305 mm) horizontally and vertically from the point of chemical application.

Appendix B

These pictures and design plans are only examples of the different systems which might be available for the salon. Please consult with an appropriate professional to determine what systems might work best for you.




SK-H2
HVAC - LOCAL EXHAUST DUCT - 6/29/16
0
5'
10'
15'
20'