

Environmental Records

[Derek Grothusen](#) made this OPRA request to [Linwood City](#).

Follow

1 follower

160/15 4A

Currently **waiting for a response** from [Linwood City](#), they should respond promptly and normally no later than **February 23, 2021** ([details](#)).

Derek Grothusen **February 11, 2021**

Unknown

Dear Linwood City,

This is a request for public records made under OPRA and the common law right of access. I am not required to fill out an official form. Please acknowledge receipt of this message.

Records requested:

EnviroSure is conducting a Phase I ESA at 200 New Road, Linwood City, NJ. In that regard, we are requesting a search of all files pertaining to the property; especially, underground storage tanks, environmental concerns, building permits, and ownership records. Electronic copies are preferred if available. Thank you.

Yours faithfully,

Derek Grothusen
EnviroSure, Inc.

Follow

1 follower

747



CONSTRUCTION PERMIT APPLICATION

RECEIVED

JUL 13 2020

Applicant Completes: Sections I, II, III (optional), IV, VI, and VII

I. IDENTIFICATION

1. Proposed Work Site at: 200 New Road

2. Name of Owner in Fee: 200 New Road LLC

Tel. (609) 231-6450 e-mail _____

Address 1051 Lochinian Dr. Stone Harbor NJ 08247

Street _____ Municipality _____ Zip code _____

3. Ownership in Fee: Public _____ Private X _____

4. Principal Contractor: Groundswell Inc. Tel. (609) 203-7879

Address 20 W. Yorkshire Ave e-mail _____

License No. OR, if new home, Builder Reg. No. LS01250 Exp. Date 5/22

Home Improvement Contractor Registration No. or Exemption Reason (if applicable): _____

Federal Emp. ID No. 22-3784545 FAX: (_____) _____

5. Architect or Engineer _____ Contact _____

Address _____ e-mail _____

Tel. (_____) _____ FAX: (_____) _____

6. Responsible Person in Charge Paul McCully has Begun

Tel. (609) 203-7879 FAX: (_____) _____

V. FEE SUMMARY (for office use only)

1. Building	\$	Update	Update
2. Electrical	\$		
3. Plumbing	\$		
4. Fire Protection	\$		
5. Elevator Devices	\$		
6. Subtotal	\$		
7. Less 20% for State Plan Review	\$		
8. Subtotal	\$		
9. State Permit Surcharge Fee	\$		
10. Subtotal	\$		
11. Cert. of Occupancy	\$		
12. Other	\$		
13. TOTAL	\$	<u>78</u>	

VI. BUILDING/SITE CHARACTERISTICS

1. Number of Stories	_____	(office use only)
2. Height of Structure	_____ ft.	
3. Area — Largest Floor	_____ sq. ft.	
4. New Building Area	_____ sq. ft.	
5. Volume of New Structure	_____ cu. ft.	
6. Max. Live Load	_____	
7. Max. Occupancy Load	_____	
8. If Industrialized Building: State Approved	_____ HUD	
9. Total Land Area Disturbed	_____ sq. ft.	
10. Flood Hazard Zone	_____	
11. Base Flood Elevation	_____ ft.	
12. Wetlands	yes _____ no _____	

IIa. PROPOSED WORK

☐ Minor Work ☐ New Building ☐ Addition ☒ Demolition

☐ Repair ☐ Alteration ☐ Renovation ☐ Reconstruction

☐ Asbestos Abat. -Subch. 8 ☐ Lead Hazard Abatement ☐ Radon Remediation ☐ Annual Permit

IIb. SUBCODES

(Check all that apply)

☐ Building	Est. Cost	Plans Rec'd by	Date Rec'd	Rejection Date	Approval Date	Re-viewer	Resubmission Approval	Rejection	Re-viewer
☐ Electrical									
☐ Plumbing									
☒ Fire Protection	<u>1400.00</u>				<u>7/14/20</u>	<u>DS</u>			
☐ Elevator									
TOTAL COST		<u>1400.00</u>							

VII. DESCRIPTION OF BUILDING USE

A. RESIDENTIAL (primary use)

1. State Specific Use: _____

2. Use Group, Proposed: _____

3. Change in Use Group, Indicate Present: _____

4. No. of dwelling units: Total Units Income-restricted

Gained, Sale _____

Lost, Sale _____

Lost, Rental _____

B. NON-RESIDENTIAL (primary use)

1. State Specific Use: _____

2. Use Group, Proposed: _____

3. Change in Use Group, Indicate Present: _____

C. MIXED USE -List secondary use(s): _____

D. Construct. Classification: Present _____ Proposed _____

III. PLAN REVIEW (optional)

DO YOU WANT:

1. ☐ Partial Releases

2. ☐ Prototype Processing

IV. DOES OR WILL YOUR BUILDING CONTAIN ANY OF THE FOLLOWING?

1. ☐ Elevators/Escalators/Lifts/ Dumbwaiters/Moving Walks	4. ☐ Refrigeration Systems	8. ☐ Smoke Control Systems in Open Wells	12. ☐ Fire Alarm
2. ☐ High Pressure Boilers	5. ☐ Cross-Connections/Backflow Preventers	9. ☐ Underground Storage Tanks	
3. ☐ Pressure Vessels	6. ☐ Hazardous Uses/Places of Assembly	10. ☐ Swimming Pools, Spas and Hot Tubs	
	7. ☐ Sprinklers/Standpipes	11. ☐ LPGas Tanks	

CERTIFICATION IN LIEU OF OATH

I. OWNER SECTION (to be completed if the applicant is the owner in fee)

I hereby certify that I am the owner in fee of the property listed on Page 1.

Mark the following applicable boxes:

- A. ☐ I further certify that a new home (private residence) will be constructed on this property for my own use and occupancy. This dwelling is to be occupied by myself and is not to be used for any purpose other than single family residential use. I attest that all construction, plumbing, or electrical work will be done, in whole or in part, by me or by subcontractors under my supervision, in accordance with all applicable laws; and, I further acknowledge that said new home is not covered under the New Home Warranty and Builders Registration Act (N.J.S.A. 46:3B-1 et seq.) and that such fact shall be disclosed to any person purchasing this property within ten years of the date of issuance of a certificate of occupancy.

I UNDERSTAND THAT IN MARKING BOX A, I ACKNOWLEDGE THAT I AM ASSUMING RESPONSIBILITY FOR THE WORK DONE ON SAID PROPERTY, THE CONDITION OF THE PROPERTY PRIOR TO, DURING, AND AFTER ANY WORK PERFORMED, AND FOR THE PERFORMANCE OF THE SUBCONTRACTORS I HIRE, EMPLOY, OR OTHERWISE CONTRACT OR WITH WHOM I MAKE AGREEMENTS TO PERFORM WORK. I AM VOLUNTARILY AND KNOWINGLY ASSUMING THIS RESPONSIBILITY.

- B. ☐ I further certify the following as required by the New Jersey Uniform Construction Code, N.J.A.C. 5:23-2.15(f)1.ix:

I personally prepared the plans submitted for: 1) the new home referred to in A.; or, 2) an addition, alteration, renovation, or repair to an existing single family residence owned and occupied by myself and located on the property listed on Page 1; or, 3) a new structure that will be physically separate from, but that will be deemed part of, an existing single family residence that is owned and occupied by myself and located on the property listed on Page 1.

- C. ☐ I further certify that I will perform or supervise the following work:

C.1. ☐ Building C.2. ☐ Fire Protection

I further certify that I will perform the following work:

C.3. ☐ Electrical C.4. ☐ Plumbing

- D. ☐ I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals, including such certification as the construction official may require, have been given or will be given prior to permit issuance.

I understand that if any of the above statements are willfully false, I am subject to punishment.

Signature _____ Date _____

II. AGENT SECTION (to be completed if the applicant is not the owner in fee)

I hereby certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(d): the proposed work is authorized by the owner in fee; and I have been authorized by the owner in fee to make this application as his agent.

I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals, including such certification as the construction official may require, have been given or will be given prior to permit issuance.

I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I understand that if any of the above statements are willfully false, I am subject to punishment.

☒ Check if contractor.

Agent Name Grandswell Env. LLC

Address 20 W. Yorkshire Ave

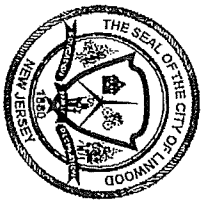
Northfield NJ 08225

Telephone 609-703-7879

Signature 

III. ☐ LEAD HAZARD ABATEMENT: Include Homeowner or Building Owner Affidavit as per N.J.A.C. 5:23-2.15(b)4.

IV. ☐ HOME ELEVATION: Include Home Elevation Contractor Certification as per N.J.S.A. 52:27D-123.16.



City of Linwood
400 Poplar Avenue
Linwood, NJ 08221
609-9267992

CERTIFICATE IDENTIFICATION

Date Issued: 07/21/2020
Control #: 12747
Permit #: 20200132

Block: 160 Lot: 15

Work Site Location: 200 NEW ROAD

LINWOOD

Owner in Fee: DR MICHAEL CARUSO

Address: 200 NEW ROAD

Linwood NJ 08221

Telephone: 609 231-6450

Agent/Contractor: GROUNDSWELL ENVIRONMENTAL

Address: 20 W YORKSHIRE AVE

NORTHFIELD NJ 08225

Telephone: 609 703-7879

Lic. No./Bids. Reg.No.: Federal Emp. No.: 22-3784542

Social Security No.:

☐ CERTIFICATE OF OCCUPANCY

This serves notice that said building or structure has been constructed in accordance with the New Jersey Uniform Construction Code and is approved for occupancy.

☒ CERTIFICATE OF APPROVAL

This serves notice that the work completed has been constructed or installed in accordance with the New Jersey Uniform Construction Code and is approved. If the permit was issued for minor work, this certificate was based upon what was visible at the time of inspection.

☐ TEMPORARY CERTIFICATE OF OCCUPANCY/COMPLIANCE

If this is a temporary Certificate of Occupancy or Compliance, the following conditions must be met no later than or will be subject to fine or order to vacate:

Home Warranty No:

Type of Warranty Plan:

Use Group:

Maximum Live Load:

Construction Classification:

Maximum Occupancy Load:

Certificate Exp Date:

Description of Work/Use:

TANK REMOVAL 275 gallons oil

Update Desc. of WK/Use:

☐ CERTIFICATE OF CLEARANCE-LEAD ABATEMENT 5:17

This serves notice that based on written certification, lead abatement was performed as per NJAC 5:17, to the following extent:

☐ Total removal of lead-based paint hazards in scope of work

☐ Partial or limited time period (____ years); see file

☐ CERTIFICATE OF CONTINUED OCCUPANCY

This serves notice that based on a general inspection of the visible parts of the building there are no imminent hazards and the building is approved for continued occupancy.

☐ CERTIFICATE OF COMPLIANCE

This serves notice that said potentially hazardous equipment has been installed and/or maintained in accordance with the New Jersey Uniform Construction Code and is approved for use until

Jim Galantino Construction Official

U.C.C-260 (rev. 5/03)

1 - APPLICANT 2 - OFFICE 3 - TAX ASSESSOR

Fees: \$0.00

Paid ☒ Check No.: 2331

Collected by: wjr



STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION



Certifies That

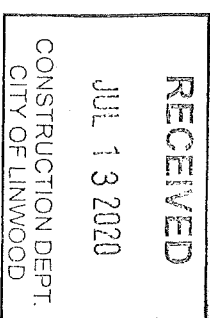
GROUNDSWELL ENVIRONMENTAL LLC
20 W YORKSHIRE AVE
Northfield, NJ 08225

*Having duly met the requirements of the
Underground Storage Tank Certification Program*

N.J.S.A. 58:10A-24.1-8

Is hereby approved to perform the following services:

CLOSURE
SUBSURFACE EVALUATION



05/31/2022
EXPIRATION DATE

US01270
CERTIFICATION NUMBER

TO BE CONSPICUOUSLY DISPLAYED AT THE FACILITY

City of Linwood

FIRE SUBCODE TECHNICAL SECTION

Date Received 07/13/2020 Date Issued 07/16/2020
Control # 12747 Permit # 20200132

A. IDENTIFICATION-APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block: 160 Lot: 15 Qualification Code:

Work Site Location : 200 NEW ROAD

Owner Details

Owner in Fee: DR MICHAEL CARUSO

Address: 200 NEW ROAD
Linwood NJ 08221

Telephone: (609) 231-6450

E-mail:

Home Improvement Registration No. or Exemption Reason:

Fire/Security Alarm Contractor No.:

Fire Protection Equipment, NJ Div of Fire Safety Installer No.:

Fire Protection Equipment, NJ Div of Fire Safety Permit No.:

B. FIRE PROTECTION CHARACTERISTICS

Use Group: Present R-5 Proposed

Constr. Class: Present Proposed

Heating System: [] New or [] Mod. to Existing

Fuel Type: [] Gas [] Oil [] Electric [] Solar

Location:

Fuel Storage Tanks:

Type: [] Flammable or [] Combustible [] LPG [] LNG Capacity 275 Fuel

1. New: \$0.00 2. Rehabilitation: \$1,400.00 3. Demolition: \$0.00

Total Cost of Fire Protection (1+2+3) Work: \$1,400.00

JOB SUMMARY (Office Use Only)

PLAN REVIEW

[] No Plans Required

[] Partial-Underslab Utilities Approved

Date: Approved by:

Fire Protection Plans Approved

Date: Approved by:

Joint Plan Review Required:

[] Bldg. [] Elec.

[] Plumbing [] Elevator

SUBCODE APPROVAL for PERMIT

Date:

Approved by:

SUBCODE APPROVAL for CERTIFICATE

[] CO [] CCO [] CA

Approved by:

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application.

Sign here: Print name here:

[] Certified Contractor [] Exempt Applicant

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK:
TANK REMOVAL 275 gallons oil

Water Supply Source
Method of Alarm/Suppression System Supervision

NUMBER
1

FEE (Office Use Only)
\$75.00

Flammable/Combustible Tanks

Alarm Systems

[] System

[] 110v Interconnected

[] CO Detectors/110v

Alarm Devices(i.e., smoke,heat,pulls,water/flow)

Supervisory Devices(i.e., tamper,low/high air)

Signaling Devices(i.e., horns/strobes,bells)

Other Devices:

TOTAL

Suppression Systems

Fire Pump — GPM Type —

Dry Pipe/Alarm Valves

Pre-action Valves

Sprinkler Heads(Dry and Wet)

Standpipes

Pre-Engineered Systems

Wet Chemical

Dry Chemical

CO2 Suppression

Foam Suppression

FM200 Suppression

Other:

Other Systems

Kitchen Hood Exhaust System

Smoke Control System

Fuel-Fired Appliances [] Gas [] Oil [] Solid

Fireplace Venting/Metal Chimney

Other:

Administrative Surcharge

Minimum Fee

State Permit Surcharge Fee

TOTAL FEE \$3.00
\$78.00



City of Linwood
400 Poplar Avenue
Linwood, NJ 08221
609 - 9267992

CONSTRUCTION PERMIT IDENTIFICATION

OWNER/PROPERTY DETAILS

Block: 160 Lot: 15 Qualification Code:
Work Site Location: 200 NEW ROAD LINWOOD
Owner In Fee: DR MICHAEL CARUSO
Address: 200 NEW ROAD
Linwood NJ 08221
Telephone: (609) 231-6450
Lic. No. / Bids. Reg. No.:
Federal Emp. No.: 22-3784542
Contractor: GROUNDSWELL ENVIRONMENTAL
Address: 20 W YORKSHIRE AVE
NORTHFIELD NJ 08225
Telephone: (609) 703-7879

is hereby granted permission to perform the following work :

[] BUILDING [] PLUMBING [] DEMOLITION
[] ELECTRICAL [X] FIRE PROTECTION [] OTHER
[] ELEVATOR DEVICES [] MECHANICAL
[] ASBESTOS ABATEMENT [] LEAD HAZARD ABATEMENT

DESCRIPTION OF WORK:
TANK REMOVAL 275 gallons oil
(Subchapter 8 only)

ESTIMATED COST OF WORK:

Cost of Construction: 0.00
Cost of Rehabilitation: 1,400.00
Cost of Demolition: 1,400.00

Total Cost: \$2,800.00

NOTE: If construction does not commence within one (1) year of date of issuance, or if construction ceases for a period of six (6) months, this permit is void.

Jim Galantino

Construction Official

Date

7-16-2020

Amount to be Paid: \$78.00
Check Number: 2331
Check amount: \$78.00
Collected by: wjr
Receipt No:
Total Cash Amount: \$78.00
Total Check Amount:
Total CC Amount:
Grand Total: \$78.00

Note:

PAYMENTS (Office Use Only)	
Building	
Electrical	
Plumbing	
Fire Protection	\$75.00
Elevator Devices	
Mechanical	
VolFee (DCA)	
AltFee (DCA)	\$3.00
DCA Minimum Fee	\$0.00
Other Fees	
CO Fee	
CCO Fee	
Minimum Fee	
Total	\$78.00
All Fees Waived:	No

OFFICE DATE RECEIVED: _____

VIII. PRIOR APPROVALS CHECKLIST (office use only)	LOCAL APPROVAL		COUNTY APPROVAL		REGIONAL APPROVAL		STATE APPROVAL		COMMENTS
	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	
☐ Zoning Officer									
☐ Planning Board									
☐ Zoning Board									
☐ Sewer Authority									
☐ Water Authority									
☐ Police Department									
☐ Health Department									
☐ Soil Conservation									
☐ N.J. Department of Community Affairs									
☐ N.J. Department of Transportation									
☐ N.J. Department of Environmental Protection									
☐ Utility Dig No.									
☐									
☐									

IX. SUBCODES AND SPECIAL REGULATIONS APPLICABLE (office use only—optional)	
Name of Code & Edition	Name of Code & Edition
Building _____	Energy _____
Electrical _____	Barrier Free _____
Plumbing _____	Flood Hazard _____
Fire Protection _____	As Built Elevation Cert. _____
Mechanical _____	Other _____

X. CERTIFICATES ISSUED (office use only)	
DATE ISSUED	DATE EXPIRED
☐ Temporary Certificate of Occupancy	No. _____
☐ Temporary Certificate of Compliance	No. _____
☐ Continued Certificate of Occupancy	No. _____
☐ Certificate of Compliance	No. _____
☐ Certificate of Occupancy	No. _____
☐ Certificate of Approval	No. _____
☐ Lead Abatement Clearance Certificate	No. _____

BLOCK 140 LOT 15 QUALIFICATION CODE _____ ADDRESS (SITE) 200 NEW RD. PERMIT NO. 129-11



CONSTRUCTION PERMIT APPLICATION

Applicant Completes: Sections I, II, III (optional), IV, VI, and VII

I. IDENTIFICATION

1. Proposed Work Site at: 344 MAY

2. Name of Owner in Fee: CARUSE MICHAEL 200 NEW RD
Tel. (609) 965-0770 e-mail _____

Address 200 NEW RD Linwood, NJ 08038
street municipally zip code

3. Ownership in Fee: Public _____ Private _____

4. Principal Contractor: ROBERTA MASSOBA AVILA Tel. (609) 965-0770
Address 50 SOUTH RD CD 08210
CARUSE 200 NEW RD 08210

License No. OR, if new home, Builder Reg. No. _____ Exp. Date _____

Home Improvement Contractor Registration No. or Exemption Reason (if applicable): 13 VAH012034

Federal Emp. ID No. 20-274883 FAX: (609) 965-2559

5. Architect or Engineer _____ Contact _____
Address _____ e-mail _____
Tel. (____) _____ FAX: (____) _____

6. Responsible Person in Charge once Work has Begun Michael S. Bonczyk
Tel. (609) 965-0770 FAX: (609) 965-2559

V. FEE SUMMARY (for office use only)

1. Building	\$	50
2. Electrical	\$	50
3. Plumbing	\$	50
4. Fire Protection	\$	50
5. Elevator Devices	\$	50
6. Subtotal	\$	250
7. Less 20% for State Plan Review	\$	50
8. Subtotal	\$	200
9. State Permit Surcharge Fee	\$	15
10. Subtotal	\$	215
11. Cert. of Occupancy	\$	0
12. Other	\$	0
13. TOTAL	\$	215

VI. BUILDING/SITE CHARACTERISTICS

1. Number of Stories _____ ft.

2. Height of Structure _____ ft.

3. Area — Largest Floor _____ sq. ft.

4. New Building Area _____ sq. ft.

5. Volume of New Structure _____ cu. ft.

6. Max. Live Load _____

7. Max. Occupancy Load _____

8. If Industrialized Building: State Approved _____ HUD _____

9. Total Land Area Disturbed _____ sq. ft.

10. Flood Hazard Zone _____ ft.

11. Base Flood Elevation _____ ft.

12. Wetlands yes _____ no _____

IIIa. PROPOSED WORK

☐ Minor Work ☐ New Building ☐ Addition ☐ Demolition

☐ Repair ☐ Alteration ☐ Renovation ☐ Reconstruction

☐ Asbestos Abat. -Subch. 8 ☐ Lead Hazard Abatement ☐ Radon Remediation ☐ Annual Permit

IIIb. SUBCODES (Check all that apply)

☒ Building	Est. Cost	Plans Rec'd by	Date Rec'd	Rejection Date	Approval Date	Re-viewer	Re-submission Approval	Re-viewer
☒ Electrical	250							
☒ Plumbing	400							
☒ Fire Protection	8000							
☐ Elevator								
TOTAL COST		8650						

FOR OFFICE USE ONLY (Optional)

1. State Specific Use:	2. Use Group, Proposed:	3. Change in Use Group, Indicate Present:	4. No. of dwelling units: <u>Total Units</u> <u>Income-restrict</u>
1. State Specific Use:	2. Use Group, Proposed:	3. Change in Use Group, Indicate Present:	4. No. of dwelling units: <u>Total Units</u> <u>Income-restrict</u>

VII. DESCRIPTION OF BUILDING USE

A. RESIDENTIAL (primary use)

1. State Specific Use: _____

2. Use Group, Proposed: _____

3. Change in Use Group, Indicate Present: _____

4. No. of dwelling units: Total Units Income-restrict

B. NON-RESIDENTIAL (primary use)

1. State Specific Use: _____

2. Use Group, Proposed: _____

3. Change in Use Group, Indicate Present: _____

C. MIXED USE -List secondary use(s): _____

D. Construct. Classification: Present _____ Proposed _____

III. PLAN REVIEW (optional)

DO YOU WANT:

1. ☐ Partial Releases

2. ☐ Prototype Processing

IV. DOES OR WILL YOUR BUILDING CONTAIN ANY OF THE FOLLOWING?

1. ☐ Elevators/Escalators/Lifts/Dumbwaiters/Moving Walks

2. ☐ High Pressure Boilers

3. ☐ Refrigeration Systems

4. ☐ Cross-Connections/Backflow Preventers

5. ☐ Hazardous Uses/Places of Assembly

6. ☐ Smoke Control Systems in Open Wells

7. ☐ Underground Storage Tanks

8. ☐ Swimming Pools, Spas and Hot Tubs

3/17/11 will be in wk of 3/21/11

CERTIFICATION IN LIEU OF OATH

I. OWNER SECTION (to be completed if the applicant is the owner in fee)
 I hereby certify that I am the owner in fee of the property listed on Page 1.

Mark the following applicable boxes:

A. () I further certify that a new home (private residence) will be constructed on this property for my own use and occupancy. This dwelling is to be occupied by myself and is not to be used for any purpose other than single family residential use. I attest that all construction, plumbing, or electrical work will be done, in whole or in part, by me or by subcontractors under my supervision, in accordance with all applicable laws; and, I further acknowledge that said new home is not covered under the New Home Warranty and Builders Registration Act (N.J.S.A. 46:3B-1 et seq.) and that such fact shall be disclosed to any person purchasing this property within ten years of the date of issuance of a certificate of occupancy.

I UNDERSTAND THAT IN MARKING BOX A, I ACKNOWLEDGE THAT I AM ASSUMING RESPONSIBILITY FOR THE WORK DONE ON SAID PROPERTY, THE CONDITION OF THE PROPERTY PRIOR TO, DURING, AND AFTER ANY WORK PERFORMED, AND FOR THE PERFORMANCE OF THE SUBCONTRACTORS I HIRE, EMPLOY, OR OTHERWISE CONTRACT OR WITH WHOM I MAKE AGREEMENTS TO PERFORM WORK. I AM VOLUNTARILY AND KNOWINGLY ASSUMING THIS RESPONSIBILITY.

B. () I further certify the following as required by the New Jersey Uniform Construction Code, N.J.A.C. 5:23-2.15(f)(1):
 I personally prepared the plans submitted for: 1) the new home referred to in A.; or, 2) an addition, alteration, renovation, or repair to an existing single family residence owned and occupied by myself and located on the property listed on Page 1; or, 3) a new structure that will be physically separate from, but that will be deemed part of, an existing single family residence that is owned and occupied by myself and located on the property listed on Page 1.

C. () I further certify that I will perform or supervise the following work:
 C.1. () Building
 C.2. () Fire Protection
 C.3. () Electrical
 C.4. () Plumbing

D. () I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals have been given, including such certification as the construction official may require.
 I understand that if any of the above statements are willfully false, I am subject to punishment.

II. AGENT SECTION (to be completed if the applicant is not the owner in fee)
 I hereby certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(d): the proposed work is authorized by the owner in fee; and I have been authorized by the owner in fee to make this application as his agent.
 I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals have been given, including such certification as the construction official may require.
 I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.
 I understand that if any of the above statements are willfully false, I am subject to punishment.

☒ Check if contractor.

Agent Name Konopka, Mersden and Sons LLC
 Address 50 South 24th St
Camden, NJ 08102
 Telephone (609) 465-0770
 Signature [Signature]

III. () LEAD HAZARD ABATEMENT: Include Homeowner or Building Owner Affidavit as per N.J.A.C. 5:17.

UCC/170 (REV. 01/04)
Professional Printing
(856) 468-7933

1 WHITE-INSPECTOR

2 CANARY-OFFICE

3 PINK-TAX ASSESSOR

4 GOLD-APPLICANT

(see reverse side)

Collected by	<i>[Signature]</i>
Cash	
Check No.	<i>2344</i>
Total	<i>210</i>
Other	
Cert. of Occupancy	
DCA State Permit Fee	<i>15</i>
Other	
Elevator Devices	
Fire Protection	<i>50</i>
Plumbing	<i>95</i>
Electrical	<i>50</i>
Building	
PAYMENTS (Office Use Only)	

NOTE: If construction does not commence within one (1) year of date of issuance, or if construction ceases for a period of six (6) months, this permit is void.

HVAC

DESCRIPTION OF WORK:

Is hereby granted permission to perform the following work:

- ☒ BUILDING
- ☒ PLUMBING
- ☒ FIRE PROTECTION
- ☐ ASBESTOS ABATEMENT
- ☐ ELEVATOR DEVICES
- ☐ LEAD HAZARD ABATEMENT
- ☐ DEMOLITION
- ☐ OTHER

(Subchapter 8 only)

IDENTIFICATION Block Lot <i>15</i> Work Site Location <i>200 NEW RD</i> Owner in Fee <i>MICHAEL CARUSO</i> Address <i>505 RYAN CMT 08210</i> Tel. <i>465 0770</i> Lic. No. or Bids. Reg. No. <i>13VH01727900</i>	Contractor <i>KONOPKE/MAHSEN HVAC</i> Qualification Code <i>15</i>
--	---

PERMIT

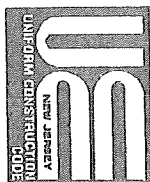


CONSTRUCTION

Date Issued: *5/25/11*
Permit # *129-11*

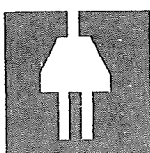
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OCT 19 2010



ELECTRICAL
SUBCODE

TECHNICAL SECTION



Date Received
Date Issued 5/25/11
Control #
Permit # 129-11

A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NON-REGISTERED ALL UTILITY DIG NO. 1-800-272-1000.

Block 160 City of LINWOOD 15 Qualification Code _____

Work Site Location 200 NEW ROAD

Owner in Fee: CARUSE - CYE MAX

Tel. (609) 465-0770 e-mail _____

Address 200 NEW RD. LINWOOD NJ street municipality zip code

Contractor: MARSDEN & SONS ELECTRIC, INC. Tel. (609) 898-0070

Address 834 KATHRYN BOULEVARD

CAPE MAY, NEW JERSEY 08204

Contractor License No. 10899

Home Improvement Contractor Registration No. or Exemption Reason (if applicable):

Federal Emp. ID No. 223187595 FAX: (609) 884-2832

B. ELECTRICAL CHARACTERISTICS

Use Group: Present _____ Proposed _____

[] Pole/Pad # _____ [] Temporary [] Other _____

Building Occupied as _____ Utility Co. _____

Estimated Cost of Electrical Work \$ 256.00

JOB SUMMARY (Office Use Only)

PLAN REVIEW

☒ No Plans Required 10-21-10 MD

Date Initial

Joint Plan Review Required

[] Building [] Plumbing

[] Fire [] Elevator

[] Elec. Plans Approved

Date: _____

Approved by: _____

SUBCODE APPROVAL

[] CO [] CCO [] CA

Date: _____

Approved by: _____

INSPECTIONS

Type: Failure Failure Approval Initial

Rough _____

Barrier-Free _____

Trench _____

Temp. Serv. _____

Constr. Serv. _____

TCO _____

Other _____

Service _____

Final _____

Barrier-Free _____

Temp. Cut-in-Card Date Issued _____

Final Cut-in-Card Date Issued _____

Annual Pool Inspection _____

Date of Grounding and Bonding _____

Certification _____

Applicant Signature/ Contractor's Seal and Signature

[] Licensed Elec. Contractor [] Certified Landscape Irrigation Contr'r [] Exempt Applicant

D. TECHNICAL SITE DATA

QTY. SIZE ITEMS

Lighting Fixture

Receptacles

Switches

Detectors

Light Poles

Motors—Fract. HP

Emergency & Exit Lights

Communications Points

Alarm Devices/F.A.C. Panel

TOTAL NUMBERS

Pool Permit/with UW Lights

Storable Pool/Spa/Hot Tub

KW Elec. Rang/Receptacle

KW Oven/Surface Unit

KW Elec. Water Heater

KW Elec. Dryer/Receptacle

KW Dishwasher

HP Garbage Disposal

KW Central A/C Unit

HP/KW Space Heater/Air Handler

KW Baseboard Heat

HP Motors 1/+ HP

KW Transformer/Generator

AMP Service

AMP Subpanels

AMP Motor Control Center

KW Elec. Sign/Outline Light

32 Change out in 10 minutes

FEE (Office Use Only)

\$ _____

10

UCC/F-120

Professional Printing

(856) 468-7933

Administrative Surcharge \$

Minimum Fee \$

State Permit Surcharge Fee \$

TOTAL FEE \$

50

1. White-Inspector Copy
2. Canary-Applicant Copy
3. Pink-Office Copy
4. White Tag-Office Copy

12/6/11 - Protect 160-voltage wiring thru cabinet

RECEIVED
OCT 19 2010



FIRE
SUBCODE
TECHNICAL SECTION

CONSTRUCTION DEPT.

A. IDENTIFICATION - APPLICANT MUST PROVIDE ALL APPLICABLE INFORMATION, WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 160 Lot 15 Qualification Code _____

Work Site Location 200 NEW RD
LYNDEN, NJ 07036

Owner in Fee: Michael Kowalek

Tel. () _____ e-mail _____

Address _____ street _____ municipality _____ zip code _____

Contractor: Boverke - MASSDA SUBS Tel. (609) 465-6770

Address CARMAZ COASTAL RD 07231

Fire Protection Equipment, NJ Div. of Fire Safety Permit No. _____ Exp. Date _____

Fire Protection Equipment, NJ Div. of Fire Safety Installer No. _____

Home Improvement Contractor Registration No. or Exemption Reason (if applicable): 13VIN0177900

Federal Emp. ID No. _____ FAX: () _____

B. FIRE PROTECTION CHARACTERISTICS

Use Group: Present _____ Proposed _____

Const. Class: Present _____ Proposed _____

Heating System: ☐ New or ☐ Modification to Existing

or ☐ Conversion or ☐ Replacement

Fuel Type: ☐ Gas ☐ Oil ☐ Electric ☐ Solar

Location: _____

Total Cost of Fire Protection Work \$ 5000

JOB SUMMARY (Office Use Only)

PLAN REVIEW

☐ No Plans Required

☐ Partial-Underslab Utilities Approved

Date: _____ Approved by: _____

☒ Fire Protection Plans Approved

Date: 12/12/11 Approved by: [Signature]

Joint Plan Review Required: _____

☐ Bldg. ☐ Elec. ☐ Plumb. ☐ Elev.

SUBCODE APPROVAL FOR PERMIT

Date: _____ Approved by: _____

SUBCODE APPROVAL FOR CERTIFICATE

☐ CO ☐ CCO ☐ CA

Date: _____ Approved by: _____

Final _____

Other _____

Approved by: _____

Applicant: When submitting this form to your Local Construction Code Enforcement Office, please provide one original plus three parts

1. White-Inspector Copy 2. Canary-Applicant Copy 3. Pink-Office Copy 4. White Tag-Office Copy in-site



Date Received
Date Issued 5/25/11
Control #
Permit # 120-11

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner, prepared and authorized to make this application.

Applicant Signature: [Signature] Contractor's Signature: [Signature]

Certified Contractor ☐ Exempt Applicant ☐

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK INSTALL GAS BACKUP HEAT

Water Supply Source _____

Method of Alarm/Suppression System Supervision _____

Flammable/Combustible Tanks

Alarm Systems

☐ System

☐ 110v interconnected

☐ CO Detectors/110v

Alarm Devices (i.e., smoke, heat, pulls, water/flow)

Supervisory Devices (i.e., tamper, low/high air)

Signaling Devices (i.e., horns/strobes, bells)

Other Devices _____

TOTAL _____

Suppression Systems

Fire Pump _____ GPM Type _____

Dry Pipe/Alarm Valves _____

Pre-action Valves _____

Sprinkler Heads (Dry and Wet) _____

Standpipes _____

Pre-engineered Systems

Wet Chemical _____

Dry Chemical _____

CO₂ Suppression _____

Foam Suppression _____

FM200 Suppression _____

Other _____

Other Systems

Kitchen Hood Exhaust System _____

Smoke Control System _____

Fuel-Fired Appliances ☒ Gas ☐ Oil ☐ Solid _____

Fireplace Venting/Metal Chimney _____

Other _____

Administrative Surcharge \$ _____

Minimum Fee \$ _____

State Permit Surcharge Fee \$ _____

TOTAL FEE \$ 50

UCC/F-140
Professional Printing
(856) 468-7933

NOT AN
ELECTRICIAN'S
OR PLUMBER'S
LICENSE

State Of New Jersey
New Jersey Office of the Attorney General
Division of Consumer Affairs

THIS IS TO CERTIFY THAT THE
Division of Consumer Affairs

HAS REGISTERED

Konopka - Marsden & Sons, LLC
Michael J. Konopka
50 S. Delsea Drive
Cape May Court House NJ 08210

FOR PRACTICE IN NEW JERSEY AS A(N): Home Improvement Contractor

12/18/2009 TO 12/31/2010
VALID

13VH01727900
LICENSE/REGISTRATION/CERTIFICATION #

Signature of Licensee/Registrant/Certificate Holder

DIRECTOR

New Jersey Office of the Attorney General
Division of Consumer Affairs
THIS IS TO CERTIFY THAT THE
Division of Consumer Affairs
HAS REGISTERED
Konopka - Marsden & Sons, LLC
Home Improvement Contractor

NOT AN ELECTRICIAN'S OR PLUMBER'S LICENSE
12/18/2009 TO 12/31/2010

VALID

SIGNATURE

13VH01727900

License/Registration/Certificate #

DIRECTOR

PLEASE DETACH HERE
IF YOUR LICENSE/REGISTRATION/
CERTIFICATE ID CARD IS LOST
PLEASE NOTIFY:

Division of Consumer Affairs
P.O. Box 46016
Newark, NJ 07101

PLEASE DETACH HERE

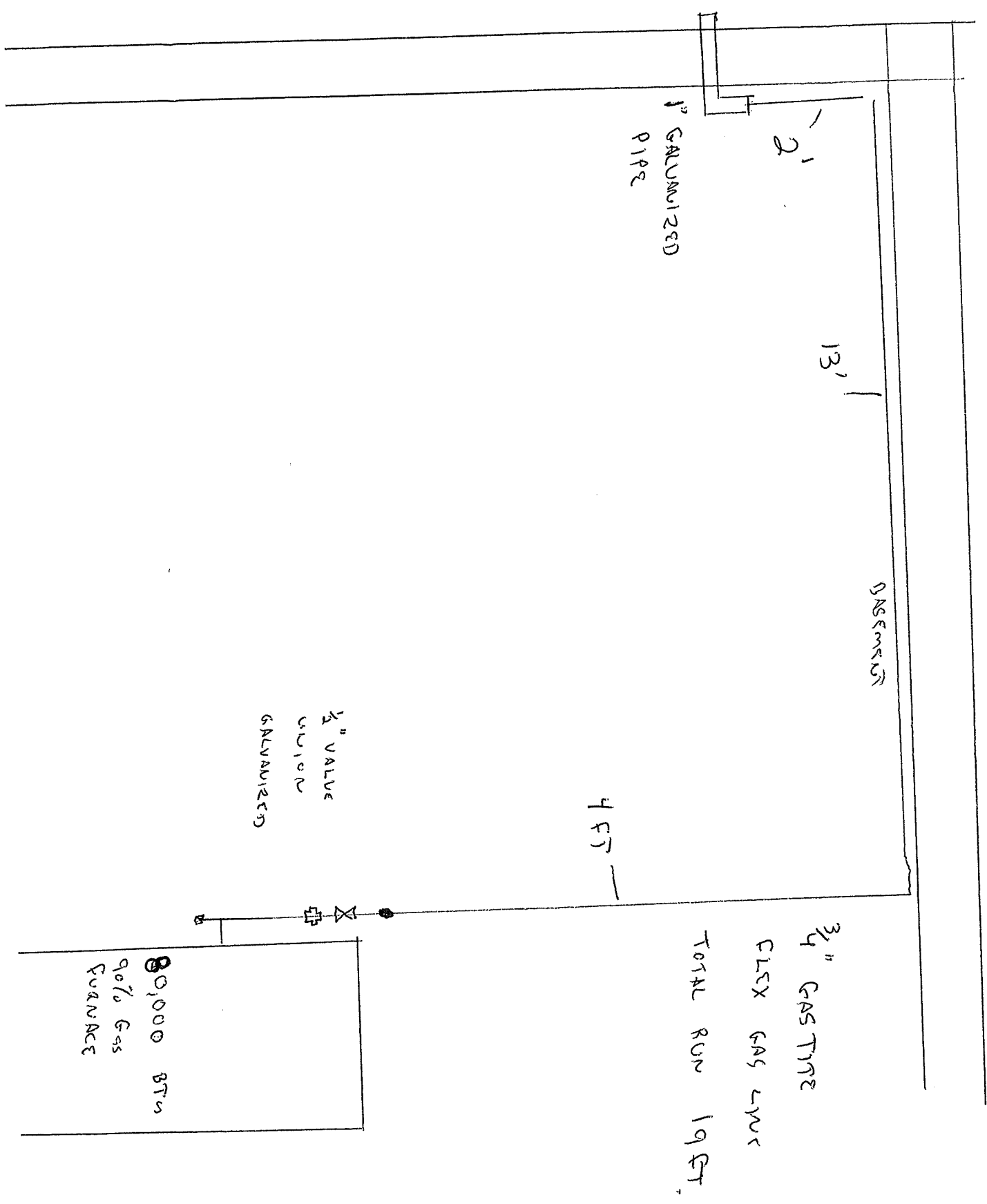
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OCT 19 7/11/11

CONSTRUCTION DEPT.
CITY OF LINWOOD

EXTERIOR WALL

CITE MAX 200 NEW ROAD LINDWOOD

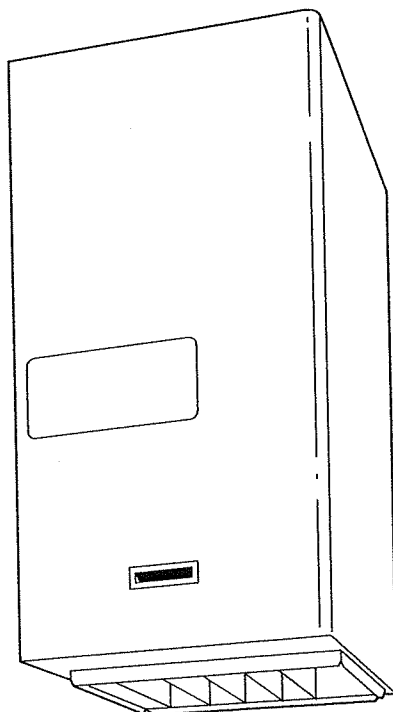


353BAV Plus 90x
4-Way Multipoise Condensing Gas Furnace
 Input Rates: 60,000 thru 120,000 Btu/h



Product Data

4-WAY MULTIPOISE DESIGN ALLOWS MORE APPLICATIONS



better—by optimizing the efficient ECM motor speed tap locations.
 A standard media filter cabinet accessory is provided with the Plus 90x in order to provide an opportunity to enhance indoor air quality. As with all other Bryant furnaces, this model is designed to work as a part of the total home comfort system which includes elements for cooling, air cleaning, humidification, ventilation and zoning. Boosting the unit's efficiency with the ECM motor and Bryant's deluxe features show the Plus 90x has been designed with the homeowner in mind.

PLUS 90X FEATURES & BENEFITS

Perfect Heat™ — The Plus 90x combines two heating stages to vary the amount of gas being used from low-heat to high-heat stage. The low-stage operation allows longer running periods, which helps maintain your most comfortable temperature, prevents drafts, reduces noise, and enhances the air quality of your home. During extreme cold, the high-heat stage will run to ensure that you are still comfortable.
Everlastic™ — Exclusive Everlastic coating, a patented polypropylene laminate is used on the secondary heat exchanger and greatly reduces maintenance.

Perfect Light™ Igniter — Bryant's unique Perfect Light™ igniter is not only physically robust but it is also electrically robust. It is capable of running at line voltage and does not require complex voltage regulators as do other brands. This unique feature further enhances the reliability of the Plus 90x gas furnace and continues Bryant's tradition of technology leadership and innovation in providing a reliable and durable product.

FanOn™ — Improves comfort all year long by allowing the homeowner to select different fan speeds during continuous fan operation to achieve more or less airflow. This is done right at the thermostat.

SmartEvap™ — This feature allows your system to reduce summertime humidity levels by nearly 10% over standard systems.

Media Filter Cabinet — Enhanced indoor air quality in your home is made easier with our media filter cabinet—a standard accessory on all Deluxe furnaces. When installed as a part of your system, this cabinet allows for easy and convenient addition of a Bryant high-efficiency air filter.

Control Center — A microprocessor controls sequencing and furnace operation. Equipped with a component test feature and status indicator light to assist in troubleshooting. The microprocessor controls blower times to start blower after main burners ignite to eliminate cold air blowing into rooms.

*As compared to the Air—Conditioning, Heating and Refrigeration Institute's standard coil—only rating (A/Cs up to 3.5 tons) when paired with selected Bryant evaporator coils.

Some of Bryant's best-engineered components contribute to the efficient performance of this condensing furnace. The Plus 90x utilizes Power Light™ hot surface ignition (HSI), which ignites the burners directly. HSI eliminates gas waste that typical continuous-pilot designs can bring. Hot surface ignition has proven to contribute to reliable start-up and operation of Bryant furnaces.
 Another deluxe feature included with this furnace is Bryant's trusted Everlastic™ secondary heat exchanger; a patented polypropylene laminate that provides exceptional heat transfer and corrosion resistance. Using the exclusive flow-through design, the secondary heat exchanger reduces the pressure drop in the furnace resulting in lower electrical usage. The high efficiency achieved by superior heat transfer is made only

The Plus 90x is an exciting addition to your product line. This high-efficiency two-stage 4-way multipoise design furnace allows more applications while the ECM motor and Bryant's control logic combine to provide a SEER increase of up to 1.5 points.* The Plus 90x is available in 5 heat/air-flow combinations and with the 4-way multipoise design can be installed in upflow, downflow, or horizontal positions covering up to 20 applications.

A UNIQUE SEER SOLUTION

A05085

Direct or Non-direct Venting — The Preferred Series *Plus* 90x can be installed as a one-pipe/non-direct vent (except 140 size) or two-pipe/direct vent furnace. This provides added flexibility to meet diverse installation needs.

Insulated Blower Compartment — The acoustical insulation reduces air and motor noise to promote quiet operation.

Combustion Products Venting — The combustion-air and vent pipes can terminate through a side wall or through the roof when used with a factory-authorized vent termination kit.

Insulation — Foil-faced insulation in heat exchanger section of the casing minimizes heat loss.

Bottom Closure — Factory-installed for side return; easily removable for bottom return.

Filter — Cleanable filter with retainer is standard.

Blower Access Panel Switch — Shuts off all 115-v power through furnace components whenever blower access panel is opened.

Casing — One piece, seamless wrap-around construction of heavy, galvanized steel that resists corrosion.

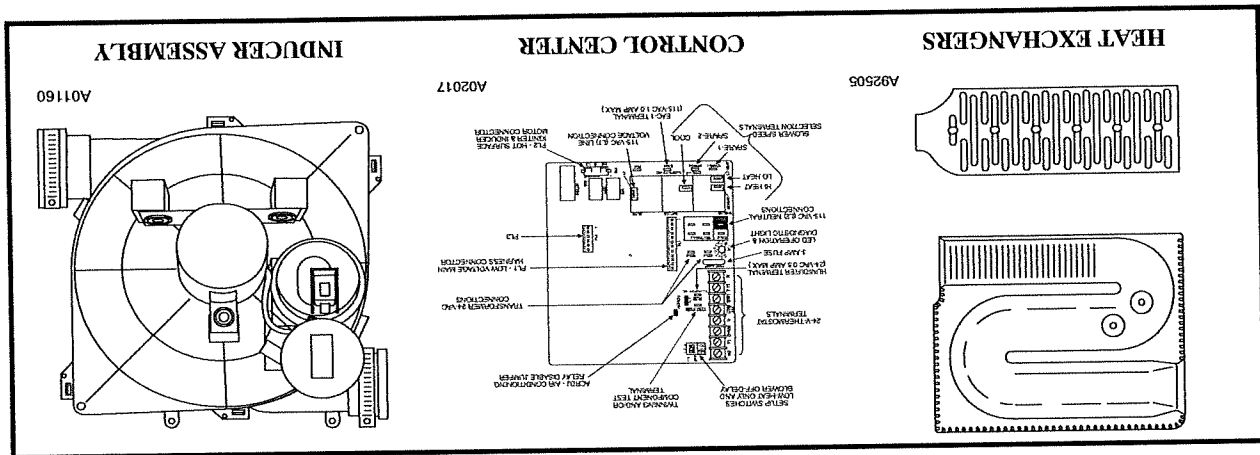
Adjustable Blower Speed — For precise airflow selection of heating or cooling operation.

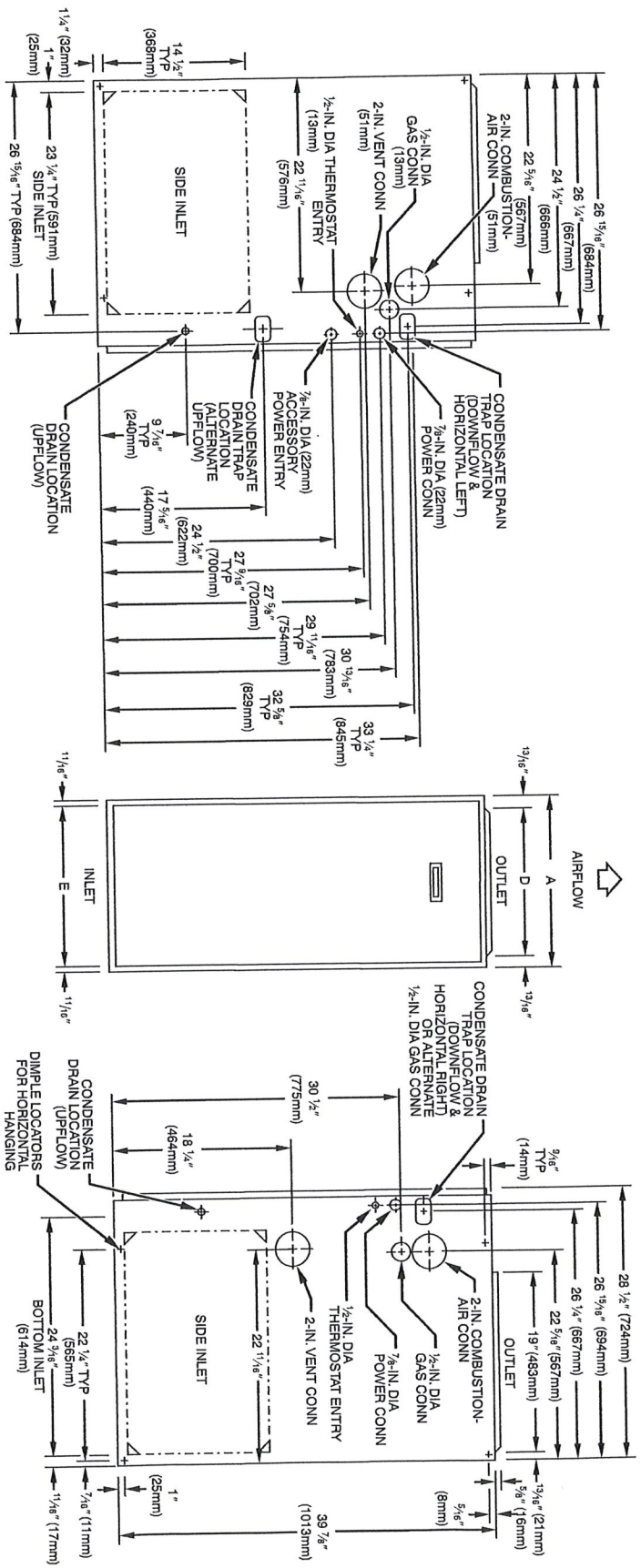
Monoport Burners — The burners are finely tuned for smooth, quiet combustion plus economical gas usage.

Slow Opening Redundant Gas Valve — Shuts off gas to burners if any of the valves fails to close completely for any reason. The slow opening feature reduces start-up noise from rapid ignition.

Quality Registration — The *Plus* 90x is engineered and manufactured under an ISO 9001 registered quality system.

Certifications — The *Plus* 90x Model units are CSA (A.G.A. and C.G.A.) design certified for use with natural and propane gases. The furnace is factory-shipped for use with natural gas. A CSA listed gas conversion kit is required to convert furnace for use with propane gas. The efficiency is AHRI efficiency rating certified. The *Plus* 90x meets California Air Quality Management District emission requirements. Refer to Vent Table, for elevation limitations.





- NOTES:**
- Minimum return-air openings at furnace, based on metal duct. If flex duct is used, see flex duct manufacturer's recommendations for equivalent diameters.
 - Minimum return-air opening at furnace:
 - For 800 CFM 16-in. (406mm) round or 14 1/2 (368mm) x 12-in. (305mm) rectangle.
 - For 1200 CFM 20-in. (508mm) round or 19 1/2 (495mm) x 19 1/2 (495mm) rectangle.
 - For 1600 CFM 22-in. (559mm) round or 23 1/2 (591mm) x 23 1/2 (591mm) rectangle.
 - For airflow requirements above 1800 CFM, see Air Delivery table in Product Data literature for specific use of single side inlets. The use of both side inlets, a combination of 1 side and the bottom, or the bottom only will ensure adequate return air openings for airflow requirements above 1800 CFM at 0.5" W.C. ESP.

DIMENSIONS - IN. (MM)

UNIT SIZE	A	D	E
036060	17-1/2 (445)	15-7/8 (403)	16 (406)
036080	17-1/2 (445)	15-7/8 (403)	16 (406)
048090	17-1/2 (445)	15-7/8 (403)	16 (406)
060100	21 (533)	19-3/8 (492)	19-1/2 (495)
060120	24-1/2 (622)	22-7/8 (581)	23 (584)

353 BAY

This forced air furnace is equipped for use with natural gas at altitudes 0 - 10,000 ft (0 - 3,050m), except 140 size furnaces are only approved for altitudes 0 - 7,000 ft.

- For upflow and downflow applications, louver must be installed 1/4" (6.35mm) or greater from 1/2" (12.7mm) forward for horizontal application. The louver must be pitched minimum 1/4" (6.35mm) to maximum of 1/2" (12.7mm) forward for proper drainage. See Installation Manual for IMPORANT unit support details on horizontal applications.
- For the applications of the air ascending and descending, the louver should be installed at a level indicated to the minimum 1/4" (6.35mm) up from the horizontal louver. For the horizontal louver, the louver should be pitched minimum 1/4" (6.35mm) and maximum 1/2" (12.7mm) up from the horizontal louver, consult the IMPORANT unit support details for the installation.
- UPFLOW OR DOWNFLOW**
-
- 1/2" (12.7mm) MAX
- HORIZONTAL**
-
- 1/2" (12.7mm) MAX



UNIT SIZE

SPECIFICATIONS									
UNIT SIZE									
CAPACITY* Direct Vent (2 - pipe) (Shaded capacities are specified on the rating plate)		Low		High		CAPACITY* Non-Direct Vent (1 - pipe)			
						Low			
						High			
						Upflow			
Downflow		Horizontal		Downflow		Horizontal		Upflow	
37000	49000	36000	49000	36000	49000	36000	49000	36000	49000
73000	93000	56000	75000	56000	75000	56000	75000	56000	75000
73000	93000	56000	75000	56000	75000	56000	75000	56000	75000
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73000	93000	56000	75000						

See notes at end of table.

353BAV

SPECIFICATIONS (CONT)

FACTORY-AUTHORIZED AND LISTED DEALER-INSTALLED OPTIONS	
KGANP4901AAA	Gas Conversion Kit - Natural-to-Propane
KGAPN4701AAA	Gas Conversion Kit - Propane-to-Natural
N/A	Twining Kit
KGASB0301ALL	Downflow Base***
2-in. (51 mm)-KGAVT0101BRA 3-in. (76 mm)-KGAVT0201BRA	Vent Termination Kit (Bracket Only for 2 Pipes)
2-in. (51 mm)-KGAVT0701CVT 3-in. (76 mm)-KGAVT0801CVT	Concentric Vent Termination Kit (Single Exit)
KGAAHT0101CFP	Condensate Freeze Protection Kit
P908-0001	Condensate Neutralizer Kit (Obtained thru RCD)
KGAE0106ETK	Vent Exhaust Pipe External Trap Kit
KGABAC011DGK	Door Gasket Kit
KGAWF1306UFR	Unframed Filter, Permanent Washable 3/4" (19 mm) 16 x 25 (406 x 635)
KGAWF1506UFR	Unframed Filter, Permanent Washable 3/4" (19 mm) 24 x 25 (610 x 635)

*U.S.A. - Gas input ratings are certified for elevations to 2000 ft. (610 M). For elevations above 2000 ft. (610 M), reduce ratings 2% for each 1000 ft. (305 M) above sea level. In Canada, derate the unit 5% for elevations 2000 to 4500 ft. (610 to 1372 M) above sea level.

†Capacity and AFUE in accordance with U.S. Government DOE test procedures Effective November 10, 1997.

‡ Airflow shown is with factory-supplied 3/4-in. (19 mm) washable filter(s).

• For air delivery above 1800 CFM, see Air Delivery table for other options.

• An airflow reduction of up to 7% may occur when using the factory-specified 4-5/16-in. (110 mm) wide, high efficiency media filter.

**Permissible voltage limits for proper furnace operation.

††Unit ampacity = 125% of largest component's full load amps plus 100% of all other potential operating components (EAC, humidifier, etc.)

‡‡Length show in measured one way along wire path between unit and service panel for maximum 2% voltage drop.

***Required for downflow installation on combustible floors when no coil box is used, or when any coil box other than a CNPV, CAPV, CAP, or CAR cased coil is used.

N/A - Not Applicable

ICS - Isolated Combustion System

MAXIMUM ALLOWABLE PIPE LENGTH - FT (M)

ALTITUDE FT (M)	UNIT SIZE (BTUH)	TERMINATION TYPE		DIRECT VENT (2-PIPE) ONLY		NON-DIRECT VENT (1-PIPE) ONLY		NUMBER OF 90° ELBOWS					
		PIPE DIA - IN. (mm)*		PIPE DIA - IN. (mm)*		PIPE DIA - IN. (mm)*							
		2 Pipe or 2-in Concentric		2 Pipe or 3-in Concentric		2 Pipe or 3-in Concentric							
0 to 2000 (0 to 610)	60,000	1-1/2 (38)	2 (51)	1-1/2 (38)	2 (51)	1-1/2 (38)	2 (51)	10	20	30	40	50	60
	80,000	1-1/2 (38)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	100,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	120,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	60,000	1-1/2 (38)	2 (51)	1-1/2 (38)	2 (51)	1-1/2 (38)	2 (51)	10	20	30	40	50	60
	80,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	100,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	120,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	60,000	1-1/2 (38)	2 (51)	1-1/2 (38)	2 (51)	1-1/2 (38)	2 (51)	10	20	30	40	50	60
	80,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	100,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	120,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
2001 to 3000† (610 to 914)	60,000	1-1/2 (38)	2 (51)	1-1/2 (38)	2 (51)	1-1/2 (38)	2 (51)	10	20	30	40	50	60
	80,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	100,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	120,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	60,000	1-1/2 (38)	2 (51)	1-1/2 (38)	2 (51)	1-1/2 (38)	2 (51)	10	20	30	40	50	60
	80,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	100,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	120,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	60,000	1-1/2 (38)	2 (51)	1-1/2 (38)	2 (51)	1-1/2 (38)	2 (51)	10	20	30	40	50	60
	80,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	100,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	120,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
3001 to 4000† (914 to 1219)	60,000	1-1/2 (38)	2 (51)	1-1/2 (38)	2 (51)	1-1/2 (38)	2 (51)	10	20	30	40	50	60
	80,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	100,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	120,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	60,000	1-1/2 (38)	2 (51)	1-1/2 (38)	2 (51)	1-1/2 (38)	2 (51)	10	20	30	40	50	60
	80,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	100,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	120,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	60,000	1-1/2 (38)	2 (51)	1-1/2 (38)	2 (51)	1-1/2 (38)	2 (51)	10	20	30	40	50	60
	80,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	100,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60
	120,000	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	2 (51)	10	20	30	40	50	60

MAXIMUM ALLOWABLE PIPE LENGTH – FT (M) CONT.

ALTITUDE FT (M)	UNIT SIZE (BTUH)	TERMINATION TYPE		DIRECT VENT (2-PIPE) ONLY		NON-DIRECT VENT (1-PIPE) ONLY		NUMBER OF 90° ELBOWS					
		PIPE DIA – IN. (mm)*	PIPE DIA – IN. (mm)*	2 (51)	1-1/2 (38)	2 (51)	1-1/2 (38)	1	2	3	4	5	6
4001 to 5000† (1219 to 1524)	60,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	1-1/2 (38)	2 (51)	1-1/2 (38)	14	9	54	49	NA	NA
	80,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	20	15	52	48	NA	NA
	100,000	2 Pipe or 3-in Concentric	3 (76)	3 (76)	2-1/2 (64)	3 (76)	2-1/2 (64)	21	16	53	49	NA	NA
	120,000	2 Pipe or 3-in Concentric	3 (76)† no disk	NA	3 (76)† no disk	NA	3 (76)† no disk	22	17	54	50	NA	NA
	100,000	2 Pipe or 3-in Concentric	2-1/2 (64)	2-1/2 (64)	2-1/2 (64)	2-1/2 (64)	2-1/2 (64)	23	18	55	51	NA	NA
	80,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	2 (51)	2 (51)	2 (51)	24	19	56	52	NA	NA
	60,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	2 (51)	2 (51)	2 (51)	25	20	57	53	NA	NA
	120,000	2 Pipe or 3-in Concentric	3 (76)	3 (76)	3 (76)	3 (76)	3 (76)	26	21	58	54	NA	NA
	100,000	2 Pipe or 3-in Concentric	2-1/2 (64)	2-1/2 (64)	2-1/2 (64)	2-1/2 (64)	2-1/2 (64)	27	22	59	55	NA	NA
	80,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	2 (51)	2 (51)	2 (51)	28	23	60	56	NA	NA
	60,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	2 (51)	2 (51)	2 (51)	29	24	61	57	NA	NA
	120,000	2 Pipe or 3-in Concentric	3 (76)	3 (76)	3 (76)	3 (76)	3 (76)	30	25	62	58	NA	NA
5001 to 6000† (1524 to 1829)	60,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	1-1/2 (38)	2 (51)	1-1/2 (38)	15	10	55	50	NA	NA
	80,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	16	11	56	51	NA	NA
	100,000	2 Pipe or 3-in Concentric	3 (76)	3 (76)	2-1/2 (64)	3 (76)	2-1/2 (64)	17	12	57	52	NA	NA
	120,000	2 Pipe or 3-in Concentric	3 (76)† no disk	NA	3 (76)† no disk	NA	3 (76)† no disk	18	13	58	53	NA	NA
	100,000	2 Pipe or 3-in Concentric	2-1/2 (64)	2-1/2 (64)	2-1/2 (64)	2-1/2 (64)	2-1/2 (64)	19	14	59	54	NA	NA
	80,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	2 (51)	2 (51)	2 (51)	20	15	60	55	NA	NA
	60,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	2 (51)	2 (51)	2 (51)	21	16	61	56	NA	NA
	120,000	2 Pipe or 3-in Concentric	3 (76)	3 (76)	3 (76)	3 (76)	3 (76)	22	17	62	57	NA	NA
	100,000	2 Pipe or 3-in Concentric	2-1/2 (64)	2-1/2 (64)	2-1/2 (64)	2-1/2 (64)	2-1/2 (64)	23	18	63	58	NA	NA
	80,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	2 (51)	2 (51)	2 (51)	24	19	64	59	NA	NA
	60,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	2 (51)	2 (51)	2 (51)	25	20	65	60	NA	NA
	120,000	2 Pipe or 3-in Concentric	3 (76)	3 (76)	3 (76)	3 (76)	3 (76)	26	21	66	61	NA	NA
6001 to 7000† (1829 to 2134)	60,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	1-1/2 (38)	2 (51)	1-1/2 (38)	16	11	56	51	NA	NA
	80,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	17	12	57	52	NA	NA
	100,000	2 Pipe or 3-in Concentric	3 (76)	3 (76)	2-1/2 (64)	3 (76)	2-1/2 (64)	18	13	58	53	NA	NA
	120,000	2 Pipe or 3-in Concentric	3 (76)† no disk	NA	3 (76)† no disk	NA	3 (76)† no disk	19	14	59	54	NA	NA
	100,000	2 Pipe or 3-in Concentric	2-1/2 (64)	2-1/2 (64)	2-1/2 (64)	2-1/2 (64)	2-1/2 (64)	20	15	60	55	NA	NA
	80,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	2 (51)	2 (51)	2 (51)	21	16	61	56	NA	NA
	60,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	2 (51)	2 (51)	2 (51)	22	17	62	57	NA	NA
	120,000	2 Pipe or 3-in Concentric	3 (76)	3 (76)	3 (76)	3 (76)	3 (76)	23	18	63	58	NA	NA
	100,000	2 Pipe or 3-in Concentric	2-1/2 (64)	2-1/2 (64)	2-1/2 (64)	2-1/2 (64)	2-1/2 (64)	24	19	64	59	NA	NA
	80,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	2 (51)	2 (51)	2 (51)	25	20	65	60	NA	NA
	60,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	2 (51)	2 (51)	2 (51)	26	21	66	61	NA	NA
	120,000	2 Pipe or 3-in Concentric	3 (76)	3 (76)	3 (76)	3 (76)	3 (76)	27	22	67	62	NA	NA
	100,000	2 Pipe or 3-in Concentric	2-1/2 (64)	2-1/2 (64)	2-1/2 (64)	2-1/2 (64)	2-1/2 (64)	28	23	68	63	NA	NA
ALTITUDE FT (M)	UNIT SIZE (BTUH)	TERMINATION TYPE		DIRECT VENT (2-PIPE) ONLY		NON-DIRECT VENT (1-PIPE) ONLY		NUMBER OF 90° ELBOWS					
		PIPE DIA – IN. (mm)*	PIPE DIA – IN. (mm)*	2 (51)	1-1/2 (38)	2 (51)	1-1/2 (38)	1	2	3	4	5	6
	60,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	1-1/2 (38)	2 (51)	1-1/2 (38)	1	2	3	4	5	6
	80,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	1	2	3	4	5	6
	100,000	2 Pipe or 3-in Concentric	3 (76)	3 (76)	2-1/2 (64)	3 (76)	2-1/2 (64)	1	2	3	4	5	6
	120,000	2 Pipe or 3-in Concentric	3 (76)† no disk	NA	3 (76)† no disk	NA	3 (76)† no disk	1	2	3	4	5	6
	60,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	1-1/2 (38)	2 (51)	1-1/2 (38)	1	2	3	4	5	6
	80,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	1	2	3	4	5	6
	100,000	2 Pipe or 3-in Concentric	3 (76)	3 (76)	2-1/2 (64)	3 (76)	2-1/2 (64)	1	2	3	4	5	6
	120,000	2 Pipe or 3-in Concentric	3 (76)† no disk	NA	3 (76)† no disk	NA	3 (76)† no disk	1	2	3	4	5	6
	60,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	1-1/2 (38)	2 (51)	1-1/2 (38)	1	2	3	4	5	6
	80,000	2 Pipe or 2-in Concentric	2 (51)	2 (51)	2-1/2 (64)	2 (51)	2-1/2 (64)	1	2	3	4	5	6

See notes at end of table.

Installation Instructions



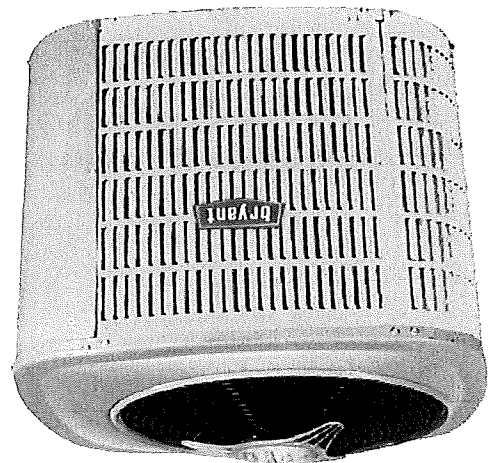
MODEL 263A / 264A / 265A
PREFERRED™ SERIES HEAT PUMP
WITH PURON® REFRIGERANT
SIZES 018 TO 060
1-1/2 TO 5 NOMINAL TONS

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NOTE: Read the entire instruction manual before starting the installation.

Fig. 1 - 263A / 264A / 265A

Preferred
SERIES



SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause death, personal injury, or property damage. Consult a qualified installer, service agency, or your distributor or branch for information or assistance. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing. Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions included in literature and attached to the unit. Consult local building codes and National Electrical Code (NEC) for special requirements.

Recognize safety information. This is the safety-alert symbol . When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury.

Understand these signal words: DANGER, WARNING, and CAUTION. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which will result in severe personal injury or death. WARNING signifies hazards which could result in personal injury or death. CAUTION is used to identify unsafe practices which may result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which will result in enhanced installation, reliability, or operation.

WARNING

ELECTRICAL SHOCK HAZARD
Failure to follow this warning could result in personal injury or death.
Before installing, modifying, or servicing system, main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.

INSTALLATION RECOMMENDATIONS

NOTE: In some cases noise in the living area has been traced to gas pulsations from improper installation of equipment.

1. Locate unit away from windows, patios, decks, etc. where unit operation sound may disturb customer.
2. Ensure that vapor and liquid tube diameters are appropriate for unit capacity.
3. Run refrigerant tubes as directly as possible by avoiding unnecessary turns and bends.
4. Leave some slack between structure and unit to absorb vibration.
5. When passing refrigerant tubes through the wall, seal opening with RTV or other pliable silicone-based caulk. (See Fig. 2.)
6. Avoid direct tubing contact with water pipes, duct work, floor joists, wall studs, floors, and walls.
7. Do not suspend refrigerant tubing from joists and studs with a rigid wire or strap which comes in direct contact with tubing. (See Fig. 2.)
8. Ensure that tubing insulation is pliable and completely surrounds vapor tube.
9. When necessary, use hanger straps which are 1 in. wide and conform to shape of tubing insulation. (See Fig. 2.)
10. Isolate hanger straps from insulation by using metal sleeves bent to conform to shape of insulation.

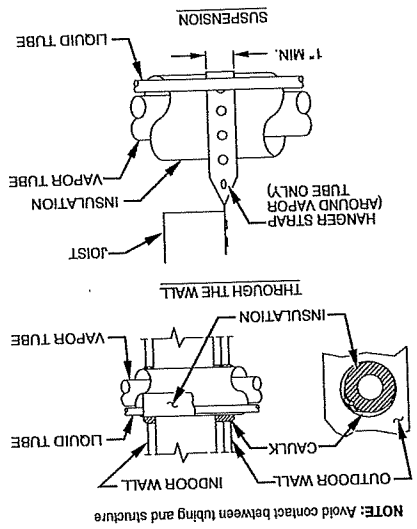


Fig. 2 - Connecting Tubing Installation

When outdoor unit is connected to factory-approved indoor unit, outdoor unit contains system refrigerant charge for operation with ARI rated indoor unit when connected by 15 ft. of field-supplied or factory accessory tubing. For proper unit operation, check refrigerant charge using charging information located on control box cover and/or in the Check Charge section of this instruction. **IMPORTANT:** Maximum liquid-line size is 3/8-in. OD for all residential applications including long line. **IMPORTANT:** Always install the factory-supplied liquid-line filter drier. Obtain replacement filter driers from your distributor or branch.

Installing TXV in Place of Piston

1. Pump system down to 2 psig and recover refrigerant.
 2. Remove hex nut from piston body. Use backup wrench on fan coils.
 3. Remove and discard factory-installed piston. Be sure Teflon® seal is in place.
 4. Reinstall hex nut. Finger tighten nut plus 1/2 turn.
- NOTE:** If the piston is not removed from the body, TXV will not function properly.

CAUTION

EQUIPMENT DAMAGE HAZARD
Failure to follow this caution may result in equipment damage or improper operation.
Use a brazing shield and wrap TXV with wet cloth or use heat sink material.

1. Pump system down to 2 psig and recover refrigerant.
2. Remove coil access panel and fitting panel from front of cabinet.
3. Remove TXV support clamp using a 5/16-in. nut driver. Save the clamp.
4. Remove R-22 TXV using a backup wrench on flare connections to prevent damage to tubing.
5. Using wire cutters, cut equalizer tube off flush with vapor tube inside cabinet.
6. Remove bulb from vapor tube inside cabinet.
7. Braze equalizer stub-tube closed. Use protective barrier as necessary to prevent damage to drain pan.
- IMPORTANT:** Route the equalizer tube of Puron TXV through suction line connection opening in fitting panel prior to replacing fitting panel around tubing.
8. Install TXV with 3/8-in. copper tubing through small hole in service panel. Use wrench and backup wrench, to avoid damage to tubing or valve, to attach TXV to distributor.
9. Reinstall TXV support clamp (removed in item 3).
10. Attach TXV bulb to vapor tube inside cabinet, in same location as original was when removed, using supplied bulb clamps (nylon or copper). See Fig. 4 for correct positioning of sensing bulb.
11. Route equalizer tube through suction connection opening (large hole) in fitting panel and install fitting panel in place.
12. Sweat inlet of TXV, marked IN to liquid line. Avoid excessive heat which could damage valve.
13. Install vapor elbow with equalizer adapter to vapor line of line set and vapor connection to indoor coil. Adapter has a 1/4-in. male connector for attaching equalizer tube.
14. Connect equalizer tube of TXV to 1/4-in. equalizer fitting on vapor line adapter.
15. Attach TXV bulb to horizontal section of suction line using clamps provided. Insulate bulb with field-supplied insulation tape. See Fig. 4 for correct positioning of sensing bulb.
16. Proceed with remainder of unit installation.

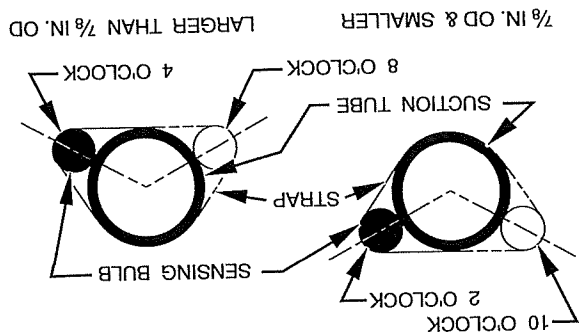


Fig. 4 — Position of Sensing Bulb

A81032

WARNING

PERSONAL INJURY AND ENVIRONMENTAL HAZARD

Failure to follow this warning could result in personal injury or death.

Relieve pressure and recover all refrigerant before system repair or final unit disposal.

Use all service ports and open all flow-control devices, including solenoid valves.

CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

If ANY refrigerant tubing is buried, provide a 6-in. vertical rise at service valve. Refrigerant tubing lengths up to 36-in. may be buried without further special consideration. Do not bury lines longer than 36 in.

Table 1—Accessory Usage

REQUIRED FOR LOW-AMBI-ENT APPLICATIONS (Below 55 °F)	REQUIRED FOR LONG LINE APPLICATIONS* (Over 80 Ft.)	REQUIRED FOR SEA COAST APPLICATIONS (Within 2 miles)
Crankcase Heater	Yes	Yes
Evaporator Freeze Thermostat	Yes (for non-Evolution systems only)	No
Winter Start Control	Yes (for non-Evolution systems only)	No
Accumulator	No	No
Compressor Start Assist Capacitor and Relay	Yes	No
Low Ambient Pressure Switch	Yes (for non-Evolution systems only)	No
Support Feet	Recommended	Recommended
Liquid Line Solenoid Valve	Yes	No
Ball Bearing Fan Motor	Standard	Standard

* For Tubing Set lengths between 80 and 200 ft. horizontal or 20 ft. vertical differential (250 ft. Total Equivalent Length), refer to the Long Line Guidelines for Air Conditioners and Heat Pumps using R-410A.

Table 2—Refrigerant Connections and Recommended Liquid and Vapor Tube Diameters (in.)

UNIT SIZE	LIQUID		RATED VAPOR (up to 80 ft*)	
	Connection Diameter	Tube Diameter	Connection Diameter	Tube Diameter
018, 024	3/8	3/8	5/8	5/8
030, 036	3/8	3/8	3/4	3/4
042, 048	3/8	3/8	7/8	7/8
060	3/8	3/8	7/8	1-1/8

Notes:

1. Tube diameters are for total equivalent lengths up to 80 ft.
2. Do not apply capillary tube or fixed orifice indoor coils to these units.
- * For Tubing Set lengths between 80 and 200 ft. horizontal or 20 ft. vertical differential (250 ft. Total Equivalent Length), refer to the Longline Guideline—Air Conditioners and Heat Pumps using R-410A.

CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

To prevent damage to unit or service valves, observe the following:

- Use a brazing shield.
- Wrap service valves with wet cloth or use a heat sink material.

Outdoor units may be connected to indoor section using accessory tubing package or field-supplied refrigerant grade tubing of correct size and condition. For tubing requirements beyond 80 ft., substantial capacity and performance losses can occur. Following the recommendations in the Long Line Guideline for Split-System Air Conditioners and Heat Pumps will reduce these losses. Refer to Table 1 for accessory requirements. Refer to Table 2 for field tubing diameters.

If refrigerant tubes or indoor coil are exposed to atmosphere, they must be evacuated to 500 microns to eliminate contamination and moisture in the system.

Outdoor Unit Connected to Factory Approved Indoor Unit

These outdoor units are carefully evaluated and listed with specific indoor coils for proper system performance.

Install Adapter Tube

1. Remove plastic retainer holding outdoor piston in liquid service valve.
2. Check outdoor piston size with matching number listed on unit rating plate.
3. Locate plastic bag taped to unit containing adapter tube.
4. Remove Teflon® seal from bag and install on open end of liquid service valve. (See Fig. 5.)
5. Remove adapter tube from bag and connect threaded nut to liquid service valve. Tighten nut finger-tight and then with wrench an additional 1/2 turn (15 ft-lb). DO NOT OVER TIGHTEN!

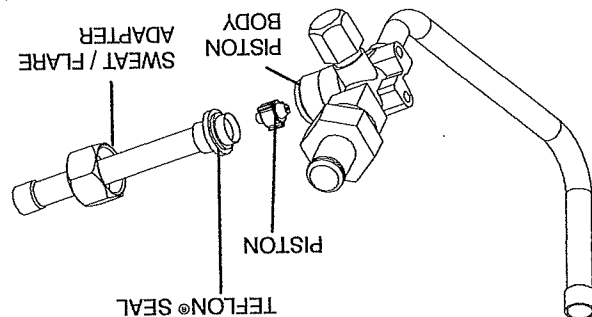


Fig. 5 — Liquid Service Valve with Sweat Adapter Tube

Refrigerant Tubing and Sweat Connections
Connect vapor tube to fitting on outdoor unit vapor service valves (see Table 2). Connect liquid tubing to adapter tube on liquid service valve. Use refrigerant grade tubing.

CAUTION

UNIT DAMAGE HAZARD
Failure to follow this caution may result in equipment damage or improper operation.
Service valves must be wrapped in a heat-sinking material such as a wet cloth while brazing.

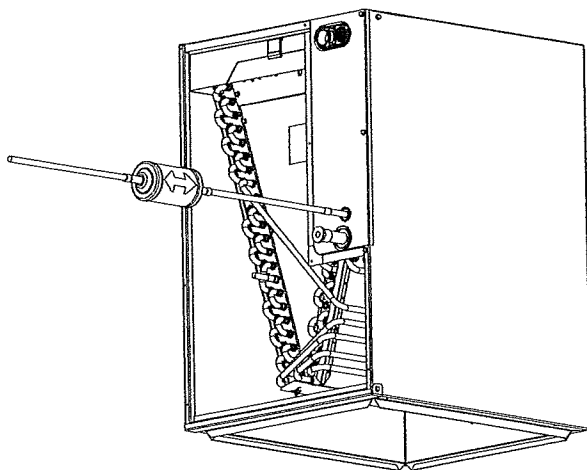
CAUTION

UNIT DAMAGE HAZARD
Failure to follow this caution may result in equipment damage or improper operation.
Installation of filter drier in liquid line is required.

Install Liquid Line Filter Drier Indoor

Refer to Fig. 6 and install filter drier as follows:

1. Braze 5 in. liquid tube to the indoor coil.
2. Wrap filter drier with damp cloth.
3. Braze filter drier to 5 in. long liquid tube from step 1.
4. Connect and braze liquid refrigerant tube to the filter drier.



Leak Testing

Leak test all joints, indoors, outdoors, and refrigerant tubing.

Evacuate Refrigerant Tubing and Indoor Coil

CAUTION

UNIT DAMAGE HAZARD
Failure to follow this caution may result in equipment damage or improper operation.
Never use the system compressor as a vacuum pump.

Refrigerant tubes and indoor coil should be evacuated using the recommended deep vacuum method of 500 microns. An alternate triple evacuation method may also be used if the deep vacuum procedure is not followed.

IMPORTANT: Always break a vacuum with dry nitrogen.

Deep Vacuum Method

The deep vacuum method requires a vacuum pump capable of pulling a vacuum of 500 microns and a vacuum gage capable of accurately measuring this vacuum depth. The deep vacuum method is the most positive way of assuring a system is free of air and liquid water. (See Fig. 7.)

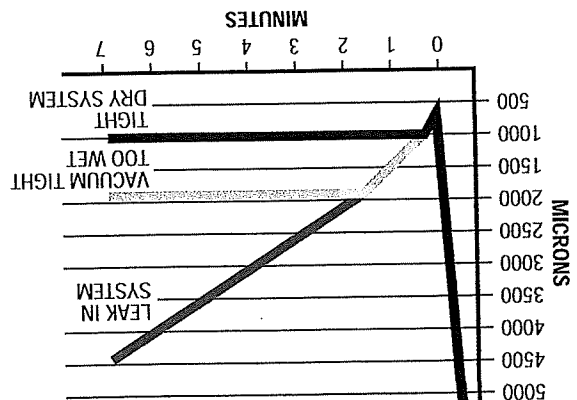


Fig. 7 - Deep Vacuum Graph

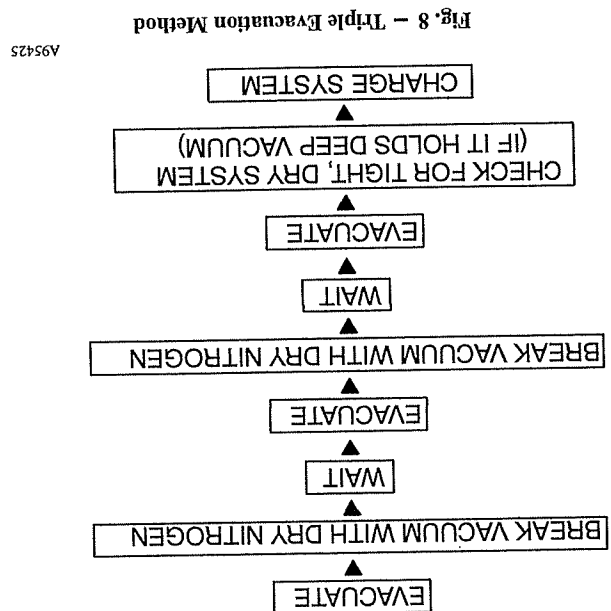


Fig. 8 - Triple Evacuation Method

- The triple evacuation method should be used when vacuum pump is only capable of pumping down to 28 in. of mercury vacuum, and system does not contain any liquid water. Refer to Fig. 8 and proceed as follows:
1. Pump system down to 28 in. of mercury and allow pump to continue operating for an additional 15 minutes.
 2. Close service valves and shut off vacuum pump.
 3. Connect a nitrogen cylinder and regulator to system and open until system pressure is 2 psig.
 4. Close service valve and allow system to stand for 1 hour. During this time, dry nitrogen will be able to diffuse throughout the system absorbing moisture.
 5. Repeat this procedure as indicated by Fig. 8. System will then be free of any contaminants and water vapor.

Triple Evacuation Method

Remove access panel to gain access to unit wiring. Extend wires from disconnect through power wiring hole provided and into unit control box.

WARNING

ELECTRICAL SHOCK HAZARD
Failure to follow this warning could result in personal injury or death.
The unit cabinet must have an uninterrupted or unbroken ground to minimize personal injury if an electrical fault should occur. The ground may consist of electrical wire or metal conduit when installed in accordance with existing electrical codes.

NOTE: Operation of unit on improper line voltage constitutes abuse and could affect unit reliability. See unit rating plate. Do not install system where voltage may fluctuate above or below permissible limits.
NOTE: Use copper wire only between disconnect switch and unit.
NOTE: Install branch circuit disconnect of adequate size per NEC to handle unit starting current. Locate disconnect within sight from and readily accessible from unit, per Section 440-14 of NEC.
Route Ground and Power Wires

Be sure field wiring complies with local and national fire, safety, and electrical codes, and voltage to system is within limits shown on unit rating plate. See unit rating plate for recommended circuit protection device.

ELECTRICAL SHOCK HAZARD
Failure to follow this warning could result in personal injury or death.
Do not supply power to unit with compressor terminal box cover removed.

WARNING

STEP 8 — Make Electrical Connections

IMPORTANT: Check to be certain factory tubing on both indoor and outdoor unit has not shifted during shipment. Ensure tubes are not rubbing against each other or any sheet metal. Pay close attention to feeder tubes, making sure wire ties on feeder tubes are secure and tight.

Final Tubing Check

Connect Ground and Power Wires

Connect ground wire to ground connection in control box for safety. Connect power wiring to connector as shown in Fig. 9.

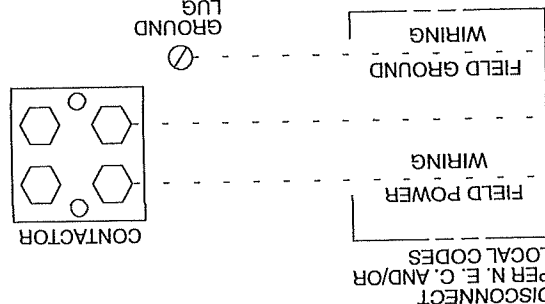


Fig. 9 — Line Connections

A91056

Connect Control Wiring

Route 24v control wires through control wiring grommet and connect leads to control wiring. See Thermostat Installation Instructions for wiring specific unit combinations.

Use No. 18 AWG color-coded, insulated (35°C minimum) wire. If thermostat is located more than 100 ft from unit, as measured along the control voltage wires, use No. 16 AWG color-coded, insulated wire to avoid excessive voltage drop.

All wiring must be NEC Class 1 and must be separated from incoming power leads.

Use furnace transformer, fan coil transformer, or accessory transformer for control power, 24v/40va minimum.

NOTE: Use of available 24v accessories may exceed the minimum 40va power requirement. Determine total transformer loading and increase the transformer capacity or split the load with an accessory transformer as required.

Final Wiring Check

IMPORTANT: Check factory wiring and field wire connections to ensure terminations are secured properly. Check wire routing to ensure wires are not in contact with tubing, sheet metal, etc.

STEP 9 —Compressor Crankcase Heater

When equipped with a crankcase heater, furnish power to heater a minimum of 24 hr before starting unit. To furnish power to heater only, set thermostat to OFF and close electrical disconnect to outdoor unit.

A crankcase heater is required if refrigerant tubing is longer than 80 ft. Refer to the Long Line Guideline-Residential Split-System Air Conditioners and Heat Pumps.

STEP 10 —Install Electrical Accessories

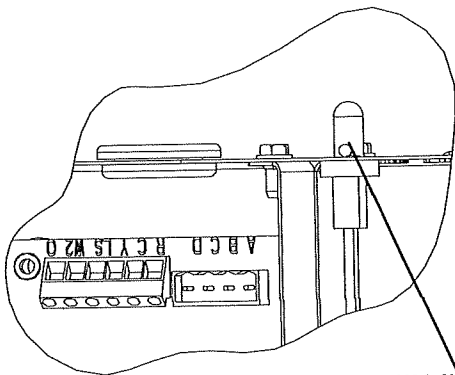
Refer to the individual installation instructions packaged with kits or accessories when installing.

STEP 11 —Check OAT Thermistor and OCT Thermistor Attachments

Outdoor Air Temperature (OAT) Thermistor is factory installed through a keyhole in the bottom shelf of the thermostat body by inserting the nibs on either sides of the thermostat body locking it in place by turning it 90 degrees, such that the spherical end of a nib faces the front of the control box.

Check to make sure the OAT is locked in place. See Fig. 10.

OAT Thermistor must be locked in place with spherical nib end facing towards the front of the control box



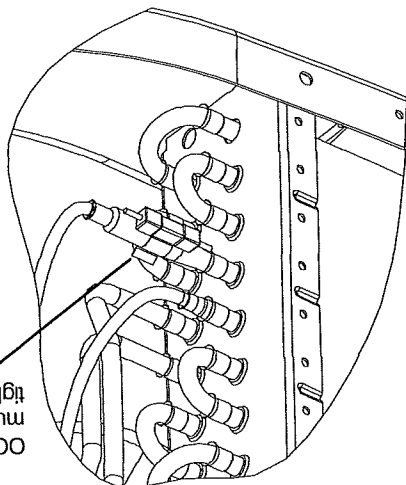
A05408

Fig. 10 — Outdoor Air Thermistor (OAT) Attachment

The Outdoor Coil Temperature (OCT) Thermistor is factory installed on the 3/8" diameter stub tube located on the coil assembly.

Check to make sure that it is securely attached with the clip as shown in Fig. 11.

OCT Thermistor must be secured tight on stub tube.



A05409

Fig. 11 — Outdoor Coil Thermistor (OCT) Attachment

STEP 13 —Check Charge

Factory charge and charging methods are shown on unit rating plate. To check charge in cooling mode, refer to Cooling Only Procedure. To check charge in heating mode, refer to Heating Check Chart Procedure.

With unit operating, charge Puron refrigerant units with liquid using a commercial type metering device in manifold hose. Charge refrigerant into suction line. Some refrigerant cylinders may contain a dip tube that allows liquid refrigerant to flow from cylinder in upright position. Check cylinder label for correct position to allow liquid flow.

Cooling Only Procedure

NOTE: If subcooling charging conditions are not favorable, charge must be weighed in accordance with unit rating plate, ± 0.6 oz./ft. of 3/8 in. liquid line above or below 15 ft, respectively. Favorable conditions fall within the ranges given on the charging chart on the outdoor unit plate.

EXAMPLE:

To calculate additional charge required for a 25 ft. line set: $25 \text{ ft.} - 15 \text{ ft.} = 10 \text{ ft.}$ X $0.6 \text{ oz./ft.} = 6 \text{ oz.}$ of additional charge.

Units installed with cooling mode TXV require charging with the subcooling method.

1. Operate unit a minimum of 10 minutes before checking charge.
2. Measure liquid service valve pressure by attaching an accurate gage to service port.
3. Measure liquid line temperature by attaching an accurate thermometer to liquid line near outdoor coil.
4. Refer to unit rating plate for required subcooling temperature.
5. Refer to Table 4. Find the point where required subcooling temperature intersects measured liquid service valve pressure.
6. To obtain required subcooling temperature at a specific liquid line pressure, add refrigerant if liquid line temperature is higher than indicated or reclaim refrigerant if temperature is lower. Allow a tolerance of $\pm 3^\circ\text{F}$.

Heating Check Chart Procedure

To check system operation during heating cycle, refer to the Heating Check Chart on outdoor unit. This chart indicates whether a correct relationship exists between system operating pressure and air temperature entering indoor and outdoor units. If refrigerant charge may not be correct. Do not use chart to adjust refrigerant charge.

NOTE: In heating mode, check refrigerant charge only when pressures are stable. If in doubt, remove charge and weigh in correct refrigerant charge.

EXAMPLE:

To calculate additional charge required for a 25 ft. line set: $25 \text{ ft.} - 15 \text{ ft.} = 10 \text{ ft.}$ X $0.6 \text{ oz./ft.} = 6 \text{ oz.}$ of additional charge.

OFFICE DATE RECEIVED: _____

VIII. PRIOR APPROVALS CHECKLIST (office use only)	LOCAL APPROVAL		COUNTY APPROVAL		REGIONAL APPROVAL		STATE APPROVAL		COMMENTS
	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	
☐ Zoning Officer									
☐ Planning Board									
☐ Zoning Board									
☐ Sewer Authority									
☐ Water Authority									
☐ Police Department									
☐ Health Department									
☐ Soil Conservation									
☐ N.J. Department of Community Affairs									
☐ N.J. Department of Transportation									
☐ N.J. Department of Environmental Protection									
☐ Utility Dig No.									
☐									
☐									

IX. SUBCODES AND SPECIAL REGULATIONS APPLICABLE (office use only—optional)	
Name of Code & Edition	Name of Code & Edition
Building _____	Energy _____
Electrical _____	Barrier Free _____
Plumbing _____	Flood Hazard _____
Fire Protection _____	As Built Elevation Cert. _____
Mechanical _____	Other _____

X. CERTIFICATES ISSUED (office use only)	
DATE ISSUED	DATE EXPIRED
☐ Temporary Certificate of Occupancy	No. _____
☐ Temporary Certificate of Compliance	No. _____
☐ Continued Certificate of Occupancy	No. _____
☐ Certificate of Compliance	No. _____
☐ Certificate of Occupancy	No. _____
☐ Certificate of Approval	No. _____
☐ Lead Abatement Clearance Certificate	No. _____

CERTIFICATION IN LIEU OF OATH

I. OWNER SECTION (to be completed if the applicant is the owner in fee)

I hereby certify that I am the owner in fee of the property listed on Page 1.

Mark the following applicable boxes:

- A. () I further certify that a new home (private residence) will be constructed on this property for my own use and occupancy. This dwelling is to be occupied by myself and is not to be used for any purpose other than single family residential use. I attest that all construction, plumbing, or electrical work will be done, in whole or in part, by me or by subcontractors under my supervision, in accordance with all applicable laws; and, I further acknowledge that said new home is not covered under the New Home Warranty and Builders Registration Act (N.J.S.A. 46:3B-1 et seq.) and that such fact shall be disclosed to any person purchasing this property within ten years of the date of issuance of a certificate of occupancy.

I UNDERSTAND THAT IN MARKING BOX A, I AM ASSUMING RESPONSIBILITY FOR THE WORK DONE ON SAID PROPERTY, THE CONDITION OF THE PROPERTY PRIOR TO, DURING, AND AFTER ANY WORK PERFORMED, AND FOR THE PERFORMANCE OF THE SUBCONTRACTORS I HIRE, EMPLOY, OR OTHERWISE CONTRACT OR WITH WHOM I MAKE AGREEMENTS TO PERFORM WORK. I AM VOLUNTARILY AND KNOWINGLY ASSUMING THIS RESPONSIBILITY.

B. () I further certify the following as required by the New Jersey Uniform Construction Code, N.J.A.C. 5:23-2.15(e)1.vii: I personally prepared the plans submitted for: 1) the new home referred to in A.; or, 2) an addition, alteration, renovation, or repair to an existing single family residence owned and occupied by myself and located on the property listed on Page 1; or, 3) a new structure that will be physically separate from, but that will be deemed part of, an existing single family residence that is owned and occupied by myself and located on the property listed on Page 1.

C. () I further certify that I will perform or supervise the following work:

C.1. () Building

C.2. () Fire Protection

I further certify that I will perform the following work:

C.3. () Electrical

C.4. () Plumbing

D. () I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals have been given, including such certification as the construction official may require.

I understand that if any of the above statements are willfully false, I am subject to punishment.

Signature _____ Date _____

II. AGENT SECTION (to be completed if the applicant is not the owner in fee)

I hereby certify the following as required by the Uniform Construction Code, N.J.A.C. 5:32-2.15(d): the proposed work is authorized by the owner in fee; and I have been authorized by the owner in fee to make this application as his agent. I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals have been given, including such certification as the construction official may require. I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I understand that if any of the above statements are willfully false, I am subject to punishment.

() Check if contractor.

Agent Name David C. Ross / Ross Construction LLC

Address 4 Pearl Street, Suite 210, Jersey City, NJ 07310

Telephone (201) 463-8308

Signature [Signature]

III. () LEAD HAZARD ABATEMENT: Include Homeowner or Building Owner Affidavit as per N.J.A.C. 5:17.

CONSTRUCTION PERMIT



Date issued 8/1/02
Control # 217-02
Permit # 217-02

IDENTIFICATION Block 20 NEAL ROAD
Work Site Location
Owner in Fee MICHAEL & LORRAINE CARUSO
Address 2106 NEW RD
NORWICH CT 06254
Tel. ()
Contractor ROSS GEN. CONST CO
Address 4 PERBUEBROOK LANE
CAPE MAY COURT HWY B8210
Tel. () 463-8308
Lic. No. or Bids. Reg. No. 22-3340673

is hereby granted permission to perform the following work:
☒ BUILDING
☒ PLUMBING
☐ LEAD HAZARD ABATEMENT
☐ ELECTRICAL
☐ FIRE PROTECTION
☐ DEMOLITION
☐ ASBESTOS ABATEMENT
☐ OTHER
 (Subchapter 8 only)

DESCRIPTION OF WORK:

OFFICE RENOVATION

NOTE: If construction does not commence within one (1) year of date of issuance, or if construction ceases for a period of six (6) months, this permit is void.

U.C.C. F170 (rev. 5/2K)

1 WHITE-INSPECTOR

2 CANARY-OFFICE

3 PINK-TAX ASSESSOR

4 GOLD-APPLICANT

Collected by	5
Cash	
Check No.	8561
Total	
Other	
Cert. of Occupancy	
DCA Training Fee	11
Other	
Elevator Devices	
Fire Protection	
Plumbing	46
Electrical	60
Building	113
PAYMENTS (Office Use Only)	

Date 7/29/02

Estimated Cost of Work \$ 13500
 Construction Official

City of Linwood, N.J.



BUILDING SUBCODE TECHNICAL SECTION

A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 2400 Lot 1050
Work Site Location Linwood Road
Owner in Fee Michael & Lorraine Canuso
Address 2406 Oak Road Northfield NJ 08225

Tele. () 609 463-8308 Fax () 609 465-4151
Contractor Ross and Coast PC
Address 4 Peachtree Brook Ln NJ 08210
Tele. () 609 463-8308 Fax () 609 465-4151
Lic. No. or Bids. Reg. No. 02-3340643
Federal Emp. No. 02-3340643

JOB SUMMARY (Office Use Only)

PLAN REVIEW	Date	Initial	INSPECTIONS	Dates (Month/Day)
			Type:	Failure Failure Approval Initial
☒ No Plans Required	<u>1/22/02</u>	<u>[Signature]</u>	Footings	
☐ All			Foundation	
☐ Footings			Slab	
☐ Foundation			Frame	
☐ Frame			Barrier-Free	
☐ Other			Insulation	
Joint Plan Review Required:			Finishes	
☐ Elec. ☐ Plumb. ☐ Fire ☐ Elevator			Energy	
SUBCODE APPROVAL			Mechanical	
☐ CO ☐ CCO ☐ CA			TCO	
Date:			Other	
Approved by:			Final	
			Barrier-Free	

B. BUILDING CHARACTERISTICS

Use Group Present Proposed
Constr. Class Present Proposed
No. of Stories Ft.
Height of Structure Ft.
Area — Largest Floor Sq. Ft.
New Bldg. Area/All Floors Sq. Ft.
Volume of New Structure Cu. Ft.
Total Land Area Disturbed Sq. Ft.

Est. Cost of Bldg. Work:

1. New Bldg. \$ 1500.-
2. Alteration \$ 1500.-
3. Total (1 + 2) \$ 3000.-



Date Received 8/1/02
Date Issued 8/1/02
Control # 217-02
Permit # 217-02

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application.

Signature [Signature]

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK

WIRE, 1054 LATE
A00 SHEATHROCK
W/ FIDISLAND 2 FLOOR

TYPE OF WORK:

☐ New Building
☐ Addition
☒ Alteration
☐ Roofing
☐ Siding
☐ Fence
☐ Sign
☐ Pool
☐ Asbestos Abatement Subchapter 8
☐ Lead Haz. Abatement NJAC 5:17
☐ Other
☐ Demolition

FEE (Office Use Only)

Administrative Surcharge \$
Minimum Fee \$
DCA Training Fee \$
TOTAL FEE \$ 118-

RECEIVED
JUL 17 2002
CONSTRUCTION DEPT
CITY OF LINWOOD



PLUMBING
SUBCODE
TECHNICAL SECTION



Date Received
Date Issued 8/1/02
Control #
Permit # 217-02

RECEIVED
JUL 17 2002

A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION, WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 160 Lot 15
Work Site Location 200 New Road
Owner in Fee Michael & Lolana Camuso
Address 2406 New Road
Tele. () 212-8300
Contractor Court House Plumbing Inc
Address 35 Don Dr. CMCH NJ 08010
Tele. () 609-465-5950 Fax () 609-463-0622
Lic. No. 7242
Federal Emp. No. 228182509

B. PLUMBING CHARACTERISTICS

Use Group Present 4" Proposed 4"
Building Sewer Size 3/4" Public Sewer 4" Private Septic 4"
Water Service Size 3/4" Public Water 4" Private Well 4"
Est. Cost of Plumbing Work \$1000

JOB SUMMARY (Office Use Only)

PLAN REVIEW		INSPECTIONS	
Type:	Failure	Dates (Month/Day)	Initial
☒ No Plans Required			
☒ Joint Plan Review Required:			
☐ Building			
☐ Fire			
☒ Plumbing Plans Approved			
Date: <u>7-18-02</u>			
Approved by: <u>[Signature]</u>			
SUBCODE APPROVAL			
☒ CO			
☒ CTO			
Date: <u>10/26/02</u>			
Approved by: <u>[Signature]</u>			

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application and perform the work listed on this application.

Signature — Contractor's Seal [Signature]

☒ Licensed Plumbing Contractor ☐ Exempt Applicant

D. TECHNICAL SITE DATA (List of all fixtures)

NO. 2
FIXTURE/EQUIPMENT
Water Closet
Urinal/Bidet
Bath Tub
Lavatory
Shower
Floor Drain
Sink
Dishwasher
Drinking Fountain
Washing Machine
Hose Bibb
Water Heater
Fuel Oil Piping
Gas Piping
Steam Boiler
Hot Water Boiler
Sewer Pump
Interceptor/Separator
Backflow Preventer
Greasetrap
Sewer Connection
Water Service Connection
Stacks
Other
Other
Other

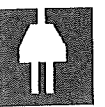
Administrative Surcharge	\$	<u>46</u>
Minimum Fee	\$	<u>1</u>
DCA Training Fee	\$	<u>47</u>
TOTAL FEE	\$	<u>94</u>



ELECTRICAL SUBCODE TECHNICAL SECTION

A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block _____ Lot _____
Work Site Location 200 New Rd Linwood NJ
Owner in Fee/Occupant Dr Caruso
Address 224 Highland Rd
C.M.C.H N.J 08210
Tele. () _____
Contractor Charles Maresden's ARS ELECT INC
Address 500TH DEANIS N.J 08245
Tele. (609) 861-1100 Fax (609) 861-1204
Lic. No. 40614
Federal Emp. No. 223161863
B. ELECTRICAL CHARACTERISTICS
Use Group Present _____ Proposed _____
☐ Pole/Pad # _____ ☐ Temporary ☐ Other _____
Building Occupied as Office Utility Co. _____
Est. Cost of Elec. Work \$ 3,000
C. CERTIFICATION IN LIEU OF OATH
I hereby certify that I am the (agent of) owner of record and am authorized to make this application and perform the work listed on this application.
Applicant's Signature/Contractor's Seal and Signature _____
[] Licensed Electrical Contractor [] Exempt Applicant



Date Received 8/1/02
Date Issued _____
Control # _____
Permit # 217-02

D. TECHNICAL SITE DATA

QTY.	SIZE	ITEMS	
10		Lighting Fixtures	
8		Receptacles	
3		Switches	
		Detectors	
1		Light Poles	
2		Motors—Fract. HP	
		Emergency & Exit Lights	
		Communications Points	
		Alarm Devices/F.A.C. Panel	
TOTAL NUMBERS			
24		Pool Permit/with UV Lights	
		Storage Pool/Spa/Hot Tub	
		KW Elec. Range/Receptacle	
		KW Oven/Surface Unit	
1	4.5	KW Elec. Water Heater	
		KW Elec. Dryer/Receptacle	
		KW Dishwasher	
		HP Garbage Disposal	
1	3	KW Central A/C Unit	
1	15 KW	HP/KW Space Heater/Air Handler	
		KW Baseboard Heat	
		HP Motors 1/2+ HP	
		KW Transformer/Generator	
		AMP Service	
		AMP Subpanels	
		AMP Motor Control Center	
		KW Elec. Sign/Outline Light	
ADMINISTRATIVE FEES			
		Administrative Surcharge	\$ 60
		Minimum Fee	\$ 4
		DCA Training Fee	\$ 4
		TOTAL FEE	\$ 68

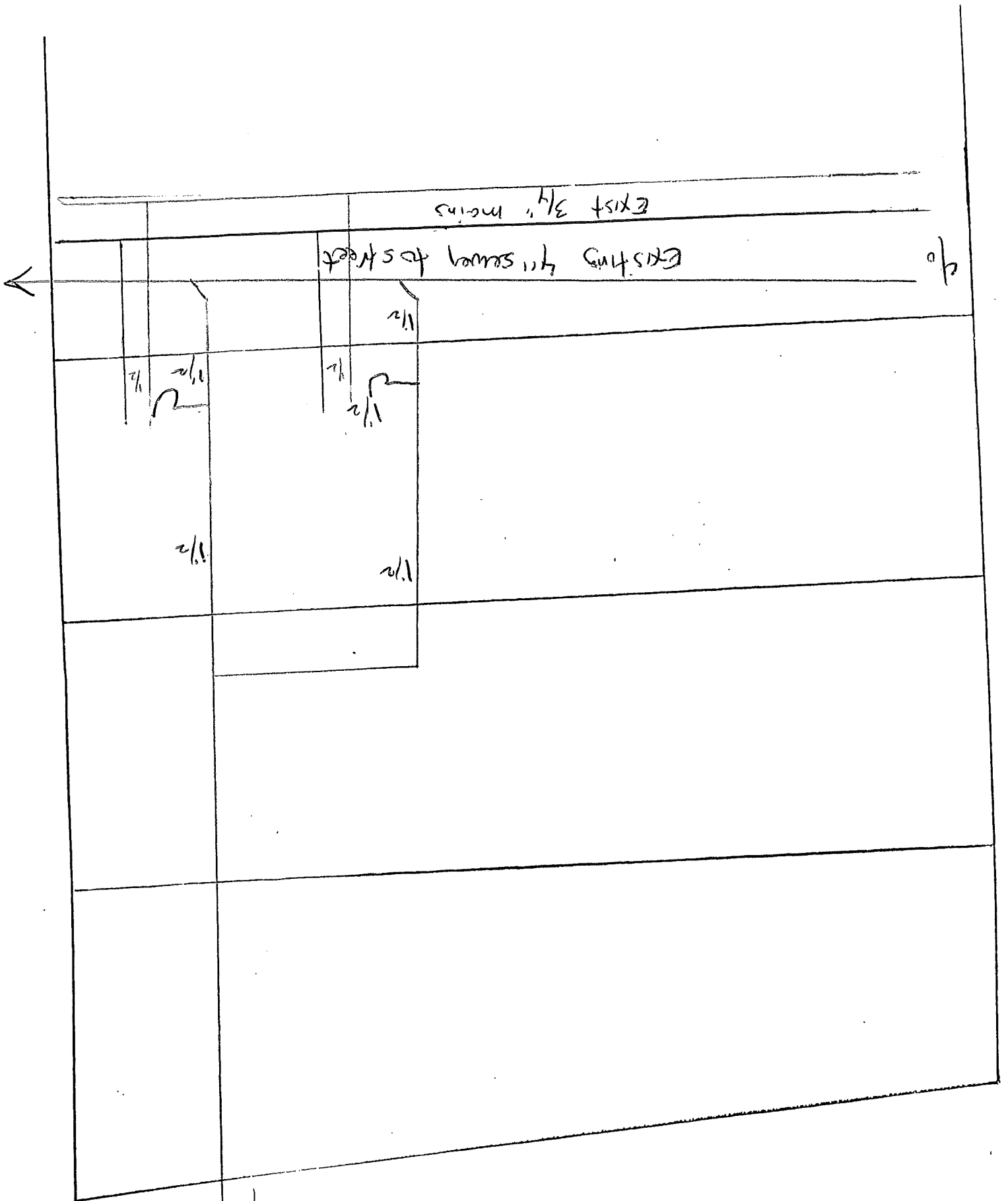
RECEIVED

JUL 17 2002

FREE OFFICE USE ONLY
CITY OF LINWOOD



35 DORY DRIVE
CAPE MAY COURT HOUSE, NJ 08210
(609) 465-5950 MASTER PLUMBERS LIC. NO. 7242

 $\frac{1}{2} \text{ VTR}$ 

City of Linwood

July 18, 2002

David C. Ross
Ross General Construction
4 Pebblebrook Lane
Cape May Court House, New Jersey 08210

Re: Permit Application for 200 New Road, Linwood

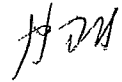
Dear Mr. Ross,

Your permit application submitted on July 17, 2002 was review Thursday, July 18, 2002. The follow is a list of missing information, documents and/or necessary corrections that must be supplied prior to issuance of your permit.

- Electric -
- Drawing indicating location of all receptacles, switches and fixtures
- Indicate usage of each room (i.e., bedroom, office, bathroom, etc.)
- Type of heat (new) and location

If you have any questions or concerns, please feel free to contact the Linwood Construction Department at 609-926-7992.

Sincerely,



William Hewitt,
Electrical Sub-code Official

cc: File

Linwood Professional Plaza, 2021 New Road, Linwood, New Jersey 08221
Linwood is an equal opportunity employer.

FAX COVER SHEET

JU1-22-02 08:56A Ross General Construction 609-465-4157

P.01

To: William HAMILTON - CITY OF LINDWOOD

Phone: 926-7992
Fax: 653 2730

From: David C. Ross

Company: Ross General Construction Inc.

Phone: (609) 463-8308

Fax: (609) 465-4157

Date: 7/22/2002

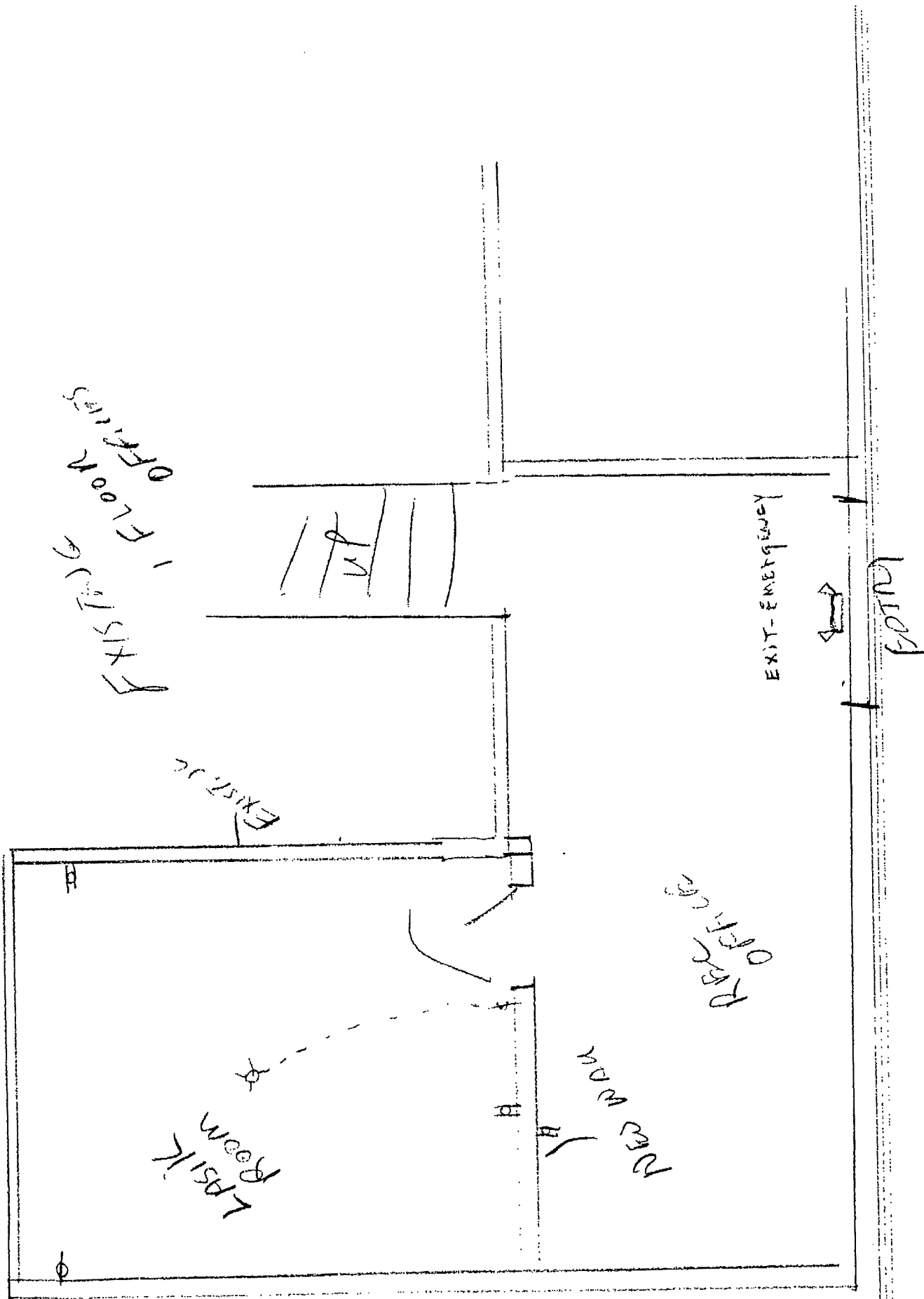
Pages (including cover sheet) 3

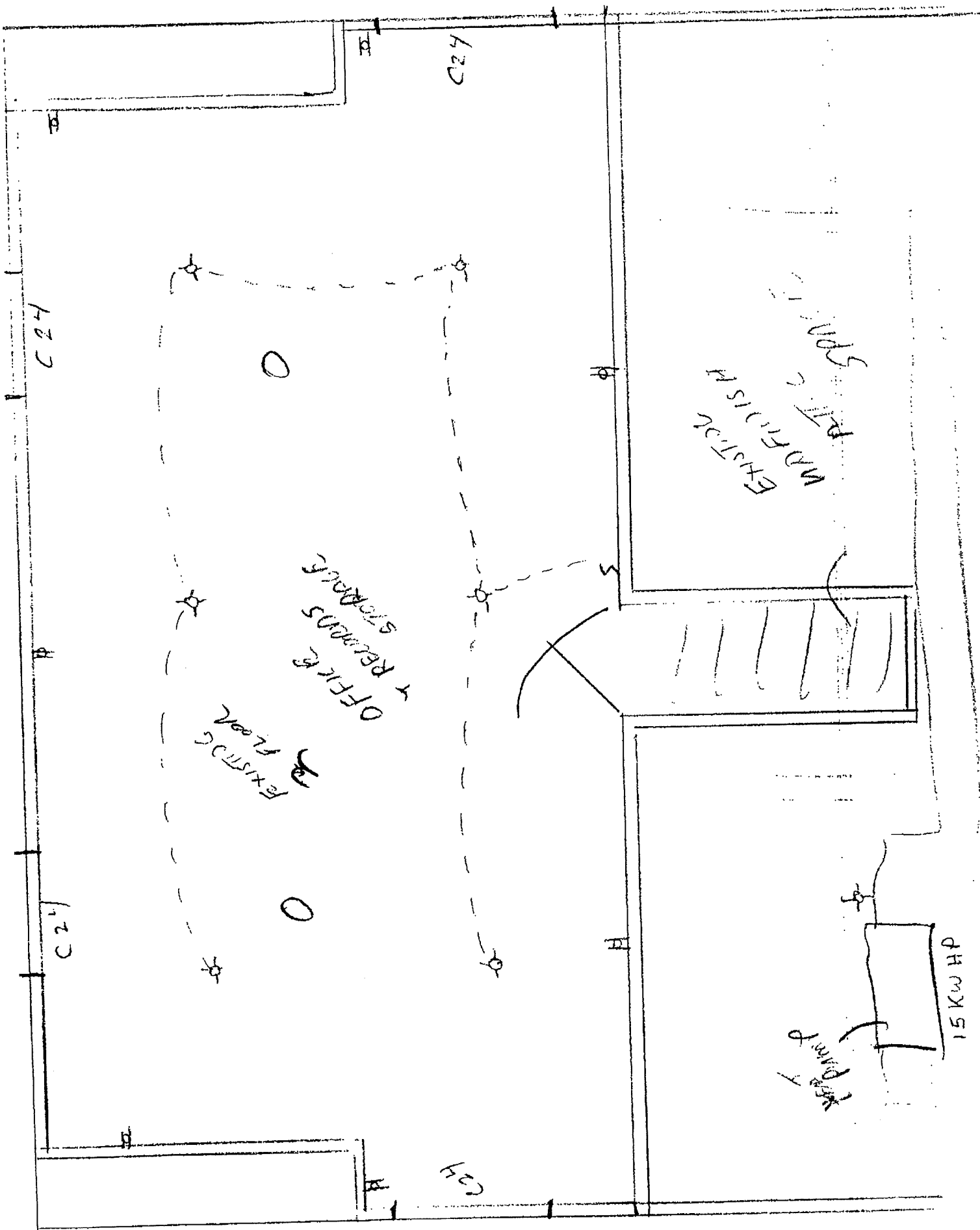
Please call immediately if there is a problem with this transmission.

Comments:

200 NEW ROAD

EXHIBIT 1 ASK COSTAL





OFFICE DATE RECEIVED: _____

VIII. PRIOR APPROVALS CHECKLIST (office use only)	LOCAL APPROVAL		COUNTY APPROVAL		REGIONAL APPROVAL		STATE APPROVAL		COMMENTS
	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	
☐ Zoning Officer									
☐ Planning Board									
☐ Zoning Board									
☐ Sewer Authority									
☐ Water Authority									
☐ Police Department									
☐ Health Department									
☐ Soil Conservation									
☐ N.J. Department of Community Affairs									
☐ N.J. Department of Transportation									
☐ N.J. Department of Environmental Protection									
☐ Utility Dig No.									
☐									
☐									

IX. SUBCODES AND SPECIAL REGULATIONS APPLICABLE (office use only—optional)

Name of Code & Edition	Name of Code & Edition	Other
Building _____	Energy _____	
Electrical _____	Barrier Free _____	
Plumbing _____	Flood Hazard _____	
Fire Protection _____	As Built Elevation Cert. _____	
Mechanical _____	Other _____	

X. CERTIFICATES ISSUED (office use only)

	DATE ISSUED	DATE EXPIRED	DATE REISSUED	DATE EXPIRED
☐ Temporary Certificate of Occupancy	No. _____	_____	_____	_____
☐ Temporary Certificate of Compliance	No. _____	_____	_____	_____
☐ Continued Certificate of Occupancy	No. _____	_____	_____	_____
☐ Certificate of Compliance	No. _____	_____	_____	_____
☐ Certificate of Occupancy	No. _____	_____	_____	_____
☐ Certificate of Approval	No. _____	_____	_____	_____
☐ Lead Abatement Clearance Certificate	No. _____	_____	_____	_____

BLOCK 160 LOT 15 QUALIFICATION CODE ADDRESS (SITE) 200 New Road PERMIT NO. 196-06



CONSTRUCTION PERMIT APPLICATION

Applicant Completes: Sections I, II, III (optional), IV, VI, and VII

I. IDENTIFICATION

1. Proposed Work Site at 200 New Road

2. Name of Owner in Fee: Dr Michael Casuso
Tel. () e-mail
Address street municipality zip code

3. Ownership in Fee: Public Private

4. Principal Contractor: Casimiro Kupinski Tel. (609) 527-2513
Address Delford Rd e-mail
License No. OR, if new home, Builder Reg. No. 13VH01104100 Exp. Date
Federal Employee No. FAX: ()

5. Architect or Engineer
Address Contact
Tel. () FAX: () e-mail

6. Responsible Person in Charge once Work has Begun
Tel. () FAX: ()

OPTIONAL (for office use only)

II. PROPOSED WORK	Est. Cost	Plans Recd by	Date Recd	Rejection Date	Approval Date	Re-viewer	Resubmission Dates	Re-viewer
1. ☒ Minor Work								
2. ☐ New Building	<u>6,000</u>							
3. ☐ Addition								
4. ☐ a. Repair								
☐ b. Alteration								
☐ c. Renovation								
☐ d. Reconstruction								
5. ☐ Fire Protection								
6. ☐ Plumbing								
7. ☐ Electrical								
8. ☐ Elevator Devices								
9. ☐ Asbestos Abat. Subch. 8								
10. ☐ Lead Hazard Abatement								
11. ☐ Demolition								
TOTAL COSTS	<u>6,000</u>							

III. DO YOU WANT: (optional)

1. ☐ Partial Releases

2. ☐ Prototype Processing

IV. DOES OR WILL YOUR BUILDING CONTAIN ANY OF THE FOLLOWING?

1. ☐ Elevators/Escalators/Lifts/
Dumbwheels/Moving Walks

2. ☐ High Pressure Boilers

3. ☐ Pressure Vessels

4. ☐ Refrigeration Systems

5. ☐ Cross-Connections/Backflow Preventers

6. ☐ Hazardous Uses/Places of Assembly

7. ☐ Sprinklers

8. ☐ Smoke Control Systems in Open Wells

9. ☐ Underground Storage Tanks

10. ☐ Swimming Pools, Spas and Hot Tubs

V. FEE SUMMARY (for office use only)

	Update	Update
1. Building		
2. Electrical	<u>144</u>	
3. Plumbing		
4. Fire Protection		
5. Elevator Devices		
6. Subtotal		
7. Less 20% for State Plan Review		
8. Subtotal	<u>8</u>	
9. State Permit Surcharge Fee		
10. Subtotal		
11. Cert. of Occupancy		
12. Other		
13. TOTAL	<u>152</u>	

VI. BUILDING/SITE CHARACTERISTICS

1. Number of Stories _____

2. Height of Structure _____ ft.

3. Area - Largest Floor _____ sq. ft.

4. New Building Area _____ sq. ft.

5. Volume of New Structure _____ cu. ft.

6. Construction Classification _____

7. Total Land Area Disturbed _____ sq. ft.

8. Flood Hazard Zone _____

9. Base Flood Elevation _____ ft.

10. Wetlands yes _____ no _____

11. Max. Live Load _____

12. Max. Occupancy Load _____

(office use only)

VII. DESCRIPTION OF BUILDING USE

A. RESIDENTIAL

1. State Specific Use:

2. Use Group:

3. Change in Use Group, Indicate Former:

4. No. of dwelling units: All Units Income-restricted

B. NON-RESIDENTIAL

1. State Specific Use:

2. Use Group:

3. Change in Use Group, Indicate Former:

CERTIFICATION IN LIEU OF OATH

I. OWNER SECTION (to be completed if the applicant is the owner in fee)

I hereby certify that I am the owner in fee of the property listed on Page 1.

Mark the following applicable boxes:

A. () I further certify that a new home (private residence) will be constructed on this property for my own use and occupancy. This dwelling is to be occupied by myself and is not to be used for any purpose other than single family residential use. I attest that all construction, plumbing, or electrical work will be done, in whole or in part, by me or by subcontractors under my supervision, in accordance with all applicable laws; and, I further acknowledge that said new home is not covered under the New Home Warranty and Builders Registration Act (N.J.S.A. 46:3B-1 et seq.) and that such fact shall be disclosed to any person purchasing this property within ten years of the date of issuance of a certificate of occupancy.

I UNDERSTAND THAT IN MARKING BOX A, I ACKNOWLEDGE THAT I AM ASSUMING RESPONSIBILITY FOR THE WORK DONE ON SAID PROPERTY, THE CONDITION OF THE PROPERTY PRIOR TO, DURING, AND AFTER ANY WORK PERFORMED, AND FOR THE PERFORMANCE OF THE SUBCONTRACTORS I HIRE, EMPLOY, OR OTHERWISE CONTRACT OR WITH WHOM I MAKE AGREEMENTS TO PERFORM WORK. I AM VOLUNTARILY AND KNOWINGLY ASSUMING THIS RESPONSIBILITY.

B. () I further certify the following as required by the New Jersey Uniform Construction Code, N.J.A.C. 5:23-2.15(e)1.vii:

I personally prepared the plans submitted for: 1) the new home referred to in A.; or, 2) an addition, alteration, renovation, or repair to an existing single family residence owned and occupied by myself and located on the property listed on Page 1; or, 3) a new structure that will be physically separate from, but that will be deemed part of, an existing single family residence that is owned and occupied by myself and located on the property listed on Page 1.

C. () I further certify that I will perform or supervise the following work:

C.1. () Building C.2. () Fire Protection

I further certify that I will perform the following work:

C.3. () Electrical C.4. () Plumbing

D. () I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals have been given, including such certification as the construction official may require.

I understand that if any of the above statements are willfully false, I am subject to punishment.

Signature _____

Date _____

II. AGENT SECTION (to be completed if the applicant is not the owner in fee)

I hereby certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(d): the proposed work is authorized by the owner in fee; and I have been authorized by the owner in fee to make this application as his agent. I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals have been given, including such certification as the construction official may require. I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I understand that if any of the above statements are willfully false, I am subject to punishment.

() Check if contractor.

Agent Name _____

Address _____

Telephone () _____

Signature _____

III. () LEAD HAZARD ABATEMENT: Include Homeowner or Building Owner Affidavit as per N.J.A.C. 5:17.



CONSTRUCTION PERMIT

Date Issued **5-19-06**
Permit # **196-06**

IDENTIFICATION Block 160 Lot 15 Qualification Code
Work Site Location 200 NEW RD Contractor CASIMIR RUPBIK
Owner in Fee DRE H. CARUSO Address 11 BELFORD RD
Address N. CAPE MAY
Tel. () 827-2513
Lic. No. or Bldgs. Reg. No. 13140210400

Is hereby granted permission to perform the following work:
☒ BUILDING ☐ PLUMBING ☐ LEAD HAZARD ABATEMENT
☐ ELECTRICAL ☐ FIRE PROTECTION ☐ DEMOLITION
☐ ELEVATOR DEVICES ☐ ASBESTOS ABATEMENT ☐ OTHER
(Subchapter 8 only)

DESCRIPTION OF WORK:

NOTE: If construction does not commence within one (1) year of date of issuance, or if construction ceases for a period of six (6) months, this permit is void.

Estimated Cost of Work \$ 6000

Construction Official

Date

5/19/06

U.C.C. F170 (rev. 01/04)

1 WHITE-INSPECTOR

2 CANARY-OFFICE

3 PINK-TAX ASSESSOR

4 GOLD-APPLICANT

(see reverse side)

OCS Printing (609) 398-4375

PAYMENTS (Office Use Only)	
Building	<u>144</u>
Electrical	
Plumbing	
Fire Protection	
Elevator Devices	
Other	
DCA State Permit Fee	<u>8</u>
Cert. of Occupancy	
Other	
Total	<u>152</u>
Check No. <u>1535</u>	
Cash	
Collected by <u>Y</u>	



BUILDING SUBCODE TECHNICAL SECTION



A. IDENTIFICATION-APPLICANT: COMPLETE ALL APPLICABLE INFORMATION, WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 160 lot 15 Qualification Code _____
Work Site Location 200 New Road

Owner in Fee: Dr. Michael Caruso

Tel. (____) _____ e-mail _____
Address _____ street _____ municipality _____ zip code _____

Contractor: Casimic Replinski Tel. (609) 827-2513
Address 11 Delford Rd e-mail cc2gda@casimic.net

Contractor License No. or Builder Registration No. 13VH02104100 Exp. Date 12-31-06
Federal Employee No. _____ FAX: (____) _____

JOB SUMMARY (Office Use Only)		PLAN REVIEW		Date		Initial		INSPECTIONS		Type:		Failure		Dates (Month/Day)		Initial	
☐	No Plans Required																
☐	All																
☐	Footings																
☐	Foundation																
☐	Frame																
☐	Other																
Joint Plan Review Required:																	
☐	Elec.	☐	Plumb.	☐	Fire	☐	Elevator										
SUBCODE APPROVAL																	
☐	CO	☐	CCO	☐	CA												
Date: _____																	
Approved by: _____																	
Barrier-Free																	

B. BUILDING CHARACTERISTICS

Use Group Present _____ Proposed _____
Constr. Class Present _____ Proposed _____
No. of Stories _____
Height of Structure _____ Ft.
Area - Largest Floor _____ Sq. Ft.
New Bldg. Area/All Floors _____ Sq. Ft.
Volume of New Structure _____ Cu. Ft.
Total Land Area Disturbed _____ Sq. Ft.

Est. Cost of Bldg. Work:
1. New Bldg. \$ 1,000
2. Rehabilitation \$ 4,000
3. Total (1+2) \$ 5,000

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application.
Signature Casimic Replinski

Date Received _____
Control # _____
Date Issued 5-19-06
Permit # 196-06

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK
Install Vinyl Siding

TYPE OF WORK:

☐ New Building
☐ Addition
☐ Rehabilitation
☒ Roofing
☐ Siding
☐ Fence
☐ Sign
☐ Pool
☐ Asbestos Abatement Subchapter 8
☐ Lead Haz. Abatement NJAC 5:17
☐ Other
☐ Demolition

Height (exceeds 6') _____
Sq. Ft. _____

144

Administrative Surcharge \$ _____
Minimum Fee \$ _____
State Permit Surcharge Fee \$ _____
TOTAL FEE \$ 152

OFFICE DATE RECEIVED: _____

VIII. PRIOR APPROVALS CHECKLIST (office use only)	LOCAL APPROVAL		COUNTY APPROVAL		REGIONAL APPROVAL		STATE APPROVAL		COMMENTS
	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	
☐ Zoning Officer									
☐ Planning Board									
☐ Zoning Board									
☐ Sewer Authority									
☐ Water Authority									
☐ Police Department									
☐ Health Department									
☐ Soil Conservation									
☐ N.J. Department of Community Affairs									
☐ N.J. Department of Transportation									
☐ N.J. Department of Environmental Protection									
☐ Utility Dig No.									
☐									
☐									

IX. SUBCODES AND SPECIAL REGULATIONS APPLICABLE (office use only—optional)

Name of Code & Edition	Name of Code & Edition	Other
Building _____	Energy _____	
Electrical _____	Barrier Free _____	
Plumbing _____	Flood Hazard _____	
Fire Protection _____	As Built Elevation Cert. _____	
Mechanical _____	Other _____	

X. CERTIFICATES ISSUED (office use only)

	DATE ISSUED	DATE EXPIRED	DATE REISSUED	DATE EXPIRED
☐ Temporary Certificate of Occupancy	No. _____	_____	_____	_____
☐ Temporary Certificate of Compliance	No. _____	_____	_____	_____
☐ Continued Certificate of Occupancy	No. _____	_____	_____	_____
☐ Certificate of Compliance	No. _____	_____	_____	_____
☐ Certificate of Occupancy	No. _____	_____	_____	_____
☐ Certificate of Approval	No. _____	_____	_____	_____
☐ Lead Abatement Clearance Certificate	No. _____	_____	_____	_____



CONSTRUCTION PERMIT APPLICATION

BLOCK NO. 160 LOT NO. 15 SUBDIVISION PERMIT NO.

IDENTIFICATION

Proposed Work at: 200 NEW ROAD CORNER of MAZUIN AVE
 Owner Name: ALFRED T GIEGERICH Tel. (609) 927-4490
 Address: 107 S. QUINCY AVE MARGATE NJ 08402
 Principal Contractor: DAVID GARRETT T/A QUALITY BUILDERS Tel. (609) 641 4494
 Address: PO Box 77 NORTHFIELD NJ
 c. No. or Builder Reg. No. _____ Federal Emp. No. _____
 Architect or Engineer: ROBERT BOOYE AIA Tel. (609) 345 8200
 Address: 1 S. SOUTH CAROLINA AVE ATLANTIC CITY NJ 08401
 Responsible Person in Charge of Work _____ Tel. () _____

PROPOSED WORK

A. TYPE OF WORK	B. CATEGORIES OF WORK	D. DOES OR WILL YOUR BUILDING CONTAIN ANY OF THE FOLLOWING?																
☐ Minor Work (Single Trade) ☐ Small Job (\$5,000 and no Prior Approvals) Complete only II.B., III and IV.A. and Page 2 ☐ New Building ☒ Addition ☐ Alteration ☐ Repair, Replacement ☐ Demolition ☐ Other: _____	<table border="1"> <thead> <tr> <th>Permit/Category</th> <th>Estimated</th> </tr> </thead> <tbody> <tr> <td>1. ☒ Building/Structural</td> <td>\$ <u>6000</u></td> </tr> <tr> <td>2. ☒ Plumbing</td> <td>\$ <u>1000</u></td> </tr> <tr> <td>3. ☒ Electrical</td> <td>\$ <u>2500</u></td> </tr> <tr> <td>4. ☐ Fire Protection</td> <td>_____</td> </tr> <tr> <td>5. ☐ Other _____</td> <td>_____</td> </tr> <tr> <td>6. ☐ Other _____</td> <td>_____</td> </tr> <tr> <td colspan="2" style="text-align: right;">TOTAL COST \$ _____</td> </tr> </tbody> </table>	Permit/Category	Estimated	1. ☒ Building/Structural	\$ <u>6000</u>	2. ☒ Plumbing	\$ <u>1000</u>	3. ☒ Electrical	\$ <u>2500</u>	4. ☐ Fire Protection	_____	5. ☐ Other _____	_____	6. ☐ Other _____	_____	TOTAL COST \$ _____		1. ☐ Elevators/Dumbwaiters 2. ☐ High-Pressure Boilers 3. ☐ Refrigeration Systems 4. ☐ Pressure Vessels 5. ☐ Hazardous Uses/Places of Assembly 6. ☐ Cross-connections/Backflow Preventors 7. ☐ Sprinklers 8. ☐ Smoke Control Systems in Open Wells
Permit/Category	Estimated																	
1. ☒ Building/Structural	\$ <u>6000</u>																	
2. ☒ Plumbing	\$ <u>1000</u>																	
3. ☒ Electrical	\$ <u>2500</u>																	
4. ☐ Fire Protection	_____																	
5. ☐ Other _____	_____																	
6. ☐ Other _____	_____																	
TOTAL COST \$ _____																		
C. DO YOU WANT: 1. ☐ Partial Releases 2. ☐ Prototype Processing																		

DESCRIPTION OF BUILDING USE (USE GROUPS)

RESIDENTIAL

1. ☐ Hotels (R-1) If new construction, enter no. of dwelling units _____
 2. ☐ Multi-Family (R-2) HMD Reg. No.: _____
 If other than new construction, enter no. of dwelling units: _____
 1. ☐ Two Family (R-3b) Before Construction: _____
 1. ☐ One-Family (R-3a) After Construction: _____
 Net Gain (or loss): _____

NON-RESIDENTIAL

- | | |
|--|---|
| ☐ Theatres with Stage (A-1-A) | 16. ☐ Institutional Detention Center (I-1) |
| ☐ Movie Theatres (A-1-B) | 17. ☐ Hospitals, Infirmeries (I-2) |
| ☐ Night Clubs (A-2) | 18. ☐ Group Homes (I-3) |
| ☐ Restaurants, Libraries, Museums (A-3) | 19. ☐ Mercantile (M) |
| ☐ Religious Assembly (A-4) | 20. ☐ Moderate-Hazard Warehouse (S-1) |
| ☐ Outdoor Assembly (A-5) | 21. ☐ Low-Hazard Warehouse (S-2) |
| ☒ Business (B) | 22. ☐ Temporary, Misc. (U) |
| ☐ Educational (E) | 23. ☐ Other _____ |
| ☐ Moderate-Hazard Factory (F-1) | |
| ☐ Low-Hazard Factory (F-2) | |
| ☐ High-Hazard (H) | |

Use Specific Use: _____

Change in Use Group, Indicate Former: _____

IV. BUILDING CHARACTERISTICS

A. OWNERSHIP

1. ☐ Private (Individual, Corp., Non-profit Inst., Etc.)
 2. ☐ Public (State, County or Local Govt.)

B. HEATING FUEL

Principal	Secondary	Type
3. ☐	☐	Gas
4. ☒	☐	Oil
5. ☐	☐	Electric
6. ☐	☐	Solid (Wood, Coal, Etc.)
7. ☐	☐	Propane
8. ☐	☐	Solar
9. ☐	☐	Other _____

C. TYPE OF SEWAGE DISPOSAL

10. ☒ Public or Private Company
 11. ☐ Private (Septic Tank, Etc.)

D. TYPE OF WATER SUPPLY

12. ☒ Public or Private Company
 13. ☐ Private (Well, Etc.)

E. BUILDING CHARACTERISTICS

14. No. of Stories _____
 15. Height of Structure _____ Ft.
 16. Area—Largest Floor _____ Sq. Ft.
 17. Bldg. Area—All Fls. _____ Sq. Ft.
 18. Volume of Structure _____ Cu. Ft.
 19. Total Land Area Disturbed _____ Sq. Ft.

CERTIFICATION IN LIEU OF OATH

I. OWNER SECTION

I hereby certify that I am the owner of the property listed on Page 1. This dwelling is to be occupied by myself and is not to be used for any purpose, other than single family residential use.

- A. ☐ I further certify that I prepared the plans submitted. This statement is made in accordance with the New Jersey Uniform Construction Code, N.J.A.C. 5:23-2.15(e)vii.
- B. ☐ I further certify that I will perform the work below.
- B1. ☐ Building B2. ☐ Electrical B3. ☐ Plumbing
- C. ☐ I further certify that a new home will be constructed on this property, for my use and occupancy. I attest that all design, construction, plumbing, or electrical work will be done by me or by subcontractors under my supervision, in accordance with all applicable laws; and further acknowledge that said new home is not covered under the New Home Warranty and Builders Registration Act (N.J.A.C. 46:3B-1 et. seq.) and that such fact shall be disclosed to any person purchasing this property within ten years of the date of issuance of a certificate of occupancy.
- D. ☐ I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I understand that if any of the above statements are willfully false, I am subject to punishment.

SIGNATURE _____ DATE _____

II. AGENT SECTION

I hereby certify that the work is authorized by the owner of record and I have been authorized by the owner to make this application as his agent.

I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I understand that if any of the above statements are willfully false, I am subject to punishment.

☒ Check if contractor.

AGENT NAME Quality Builders TEL. (1) 641-4494

ADDRESS 1321 West Mill Road

Northfield NJ

SIGNATURE [Signature]

Don Sincora

FORD AND FLOWER
Suite 618
1125 Atlantic Avenue
Atlantic City, New Jersey 08401

IN THE MATTER OF THE APPLICATION OF : PLANNING BOARD OF THE CITY
ALFRED J. GIEGERICH FOR PRELIMINARY :
AND FINAL SITE PLAN APPROVAL AND : OF LINWOOD
VARIANCES WITH RESPECT TO BLOCK 160,
LOT 15 ON THE TAX MAP OF THE CITY : DECISION AND RESOLUTION
OF LINWOOD. :

THIS MATTER having been opened to the Planning Board of the City of Linwood by the applicant, Alfred J. Giegerich, and the Board having considered the testimony of the applicant, the application and plans on file and the engineer's review letter by Jonathan E. Rosenkrantz, P.E., under date of April 16, 1987 (which is herewith incorporated by reference), the Board has made the following factual findings:

1. The applicant is the owner of the subject property which is located in the limited business zone. The proposed use is a permitted use.
2. The purpose of the application is to construct an addition to the existing structure on the premises for use as an insurance office.
3. The applicant requires variances for each of the following items:

DEPARTMENT OF BUILDING AND INSPECTIONS
(Plan Review)

DATE 4-14-88

NAME GREGORY
ADDRESS 201 New Road
BLOCK 160 LOT 15
TYPE OF BUILDING

20x32	640 CF
20	16
640	3840
	640
	10,240

SQUARE FT.

ZONE

OCCUPANCY LOAD: 10,240 CF

CUBIC FT.:

USE GROUP:

CONSTR. CLASS.

Construction Official Don Sinclair

A The proposed additional parking stalls extend within 16 feet of New Road. The ordinance requires a 20 foot wide landscaping buffer.

B. The rear and side yard setbacks for the proposed building addition are approximately 30 feet. The ordinance requires 40 foot setbacks.

C. The total first floor area for the proposed building addition plus the existing structure is approximately 1530 square feet. The ordinance requires a minimum area of 6000 square feet.

4. The existing parking lot extends within 15 feet of New Road and within 5 feet of Marvin Avenue. There is no land available adjacent to the subject property which would permit building a structure with the requisite first floor square footage which would also conform with coverage from the setback and parking requirements.

In consideration of the foregoing it is the decision of the Planning Board that preliminary and final site plan approval can be granted together with the requested variances subject to the following conditions:

1. The applicant shall obtain the following other agency approvals, permits or, in the alternative, letters of non-interest:

- A. Atlantic County Planning Board;
- B. Municipal Sewer Department;
- C. New Jersey Water Company;
- D. Cape Atlantic Soil Conservation Service;
- E. New Jersey Department of Transportation-
Engineering Department.

2. The applicant shall supply revised drawings to include a landscaping plan, greening the parking area from the adjoining residential zone to the east. Said plan shall be subject to review and approval by the Planning Board Engineer.

3. The applicant shall submit an engineer's estimate of the project cost to be reviewed and approved by the Planning Board Engineer.

4. The applicant shall supply revised plans to conform the Type A Inlet Detail with the proposed pipe size and orientation.

5. The applicant shall supply for review and approval by the Planning Board Engineer, revised plans for the proposed leaching bed.

6. The applicant must supply revised plans to include a detail for trash storage (unless trash storage will be stored within the building).

7. The applicant shall submit a revised plan to conform the zoning information block to reflect the Planned Commercial Development Zone.

8. The applicant shall submit revised plans to include an "Approval Block" for authorized signatures.

9. The applicant will be required to post surety with the City Clerk in a form subject to approval by the Planning Board in the amount of 120% of the approved engineer's estimate for the the cost of improvements.

10. The applicant must post a certified check with the City Clerk in the amount of 5% of the approved engineer's estimate as a deposit toward the cost of engineering inspection.

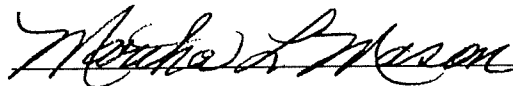
11. No building permit will be issued until all required sureties and deposits have been posted with the City Clerk.

12. No Certificate of Occupancy will be issued until all items set forth in the site plan have been completed and accepted by the City Engineer.

13. As-built utility drawings by the City Engineer shall be submitted before any surety is considered for release or reduction.

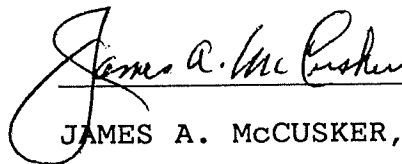
14. In consideration of the foregoing it is the decision of the Board, for the reasons stated on the record, that granting the requested variances would advance the purposes of the Municipal Land Use Law, and that the benefits obtained by granting the variances would substantially outweigh any detriment.

NOW, THEREFORE, BE IT RESOLVED by the Planning Board of the City of Linwood that the applicant be and herewith is granted preliminary and final site plan approval as well as the variances detailed in Paragraph 1, A, B, and C above pertaining to the location of the additional parking stalls, the rear and side yard setbacks and the total first floor area.



MARTHA L. MASON, CHAIRPERSON

3-25-88

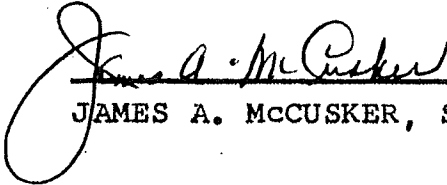


JAMES A. McCUSKER, SECRETARY

The above Resolution for the application of site plan approval, having been duly made and seconded, the following votes were recorded.

Everleth - Yes
Helfrick - Yes
Henry - Yes
Horvath - Yes
Lhulier - Yes
Newton - Yes
Vass - Yes
Mason - Yes
McCusker - Yes

On May 18, 1987, at its regular monthly hearing, the above voting members present approved this Decision and Resolution.



JAMES A. MCCUSKER, SECRETARY

Don't worry

POLE NO. _____

METER BOARD NO. 579-151-783

PERMIT NO. _____



CUT-IN-CARD

Owner

Al Maspovich

Occupant

Location

No. 200 Mansfield Highway Block 150 Lot 15

Street

Town

State

Zip

Installed By

Inspector

Michael

Lic. No.

Lic. No.

Date

2/13/86

☐ TEMPORARY

— Installation of _____

in above premises has been inspected and found in such conditions as to warrant temporary approval for use of current. This approval is void after _____ days.

☒ FINAL

— Installation as itemized on reverse side has been inspected and is in accordance with the New Jersey Uniform Construction Code and the regulations and requirements of the Utility Company.

U.C.C. Form F-350 (8/83)

150 amp

FELLOWS, READ & ASSOCIATES, Inc. CONSULTING ENGINEERS, SURVEYORS & PLANNERS
CENTRAL PARK EAST, 222 NEW ROAD, LINWOOD, NEW JERSEY 08221
(609) 653-8868 FAX (609) 653-6784



John C. Fellows (1890-1981)

John C. Fellows, Jr.
Joseph R. Read
Carol L. Beske
William M. England
Michael F. O'Donnell
Lynn M. Robinson
Jonathan E. Rosenkrantz
Robert W. Smith, Jr.

Reginald S. Asbury
Hayes A. Hewitt, Jr.
Peter J. Koehler, Jr.
Richard P. Ramirez
James F. Stanton

Paul J. Casagrande
Timothy J. Cavanaugh
James Matticola
Matthew Smith
Darcel D. Terry
R. Bradley Tombs
Robert D. Toscan
Michael G. Zilinski

October 20, 1988

Mayor & Council
City of Linwood
City Hall
400 Poplar Avenue
Linwood, NJ 08221

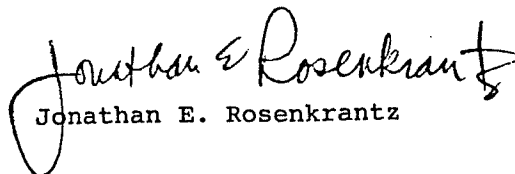
REF: Giegerich Site Plan
Block 160, Lot 15
F.R.A. File #A00128

Dear Mayor & Council:

We have inspected this project in the field and find that the following work items have been constructed with methods and materials in conformance with City Ordinances and accepted engineering practice. A reduction of surety can therefore be approved for those items as noted on the attached sheet, in the amount of \$14,377.80.

Respectfully submitted,

Fellows, Read & Associates, Inc.


Jonathan E. Rosenkrantz

JER/sr

cc: J. Breidenstine, Sec.
A. Giegerich

Giegerich Site Plan

Item	Description	Quantity	Price	Previously approved Current approval				Balance
				Amount	for release	for release		
1.	24" C.M.P. Perf.	70 l.f.	\$26.00	\$ 1,820.00	-0-	\$ 1,820.00	-0-	-0-
2.	Morifi Fabric	1750 s.y.	.50	875.00	-0-	875.00	-0-	-0-
3.	1½"-2" Crushed stone	94.5 tons	30.00	2,835.00	-0-	2,835.00	-0-	-0-
4.	Excavation	93 l.y.	8.00	744.00	-0-	744.00	-0-	-0-
5.	Type 'E' Lat'ch basins	2-Units	1,500.00	3,000.00	-0-	3,000.00	-0-	-0-
6.	FABC-1, Mix I-5	151 s.y.	7.50	1,132.50	-0-	1,132.50	-0-	-0-
	2" thick with 6" thick gravel base							
7.	6" Thick Concrete Slab	50 s.f.	7.50	375.00	-0-	375.00	-0-	-0-
8.	6"x8"x18" Concrete Curb	100 l.f.	12.00	1,200.00	-0-	1,200.00	-0-	-0-
				<u>\$11,981.50</u>	<u>-0-</u>	<u>\$11,981.50</u>		<u>-0-</u>

Total Cost of Improvements	\$11,981.50
Plus 20% Contingency	2,396.30
Total Bond Amount	<u>\$14,377.80</u>
Less Previous Reduction	-0-
Less Current Reduction	<u>14,377.80</u>
Balance of Surety	-0-



CERTIFICATE

CERT. NO.	736-88		
DATE ISSUED	10-25-88		
Block	160	Lot	15
Subdivision			

IDENTIFICATION

Owner Alfred J. Giegerich Agent Quality Builders
Address Marvin & New Rd. Address _____
Linwood, N.J. 08221
Tel. (____) _____ Tel. (____) _____
Work Site Address Marvin & New Rd. Lic. No. _____
Federal Emp. No. _____

PAYMENTS

Fees Remitted \$ _____
☐ Check No. _____
☐ Cash _____
☐ Other PREPAID
Collected By: _____
Date: _____

CERTIFICATE OF OCCUPANCY/APPROVAL

A. ☒ CERTIFICATE OF OCCUPANCY

☐ CERTIFICATE OF APPROVAL

This serves notice that said building, structure, or equipment has been constructed or installed in accordance with the New Jersey Uniform Construction Code, and is approved for use and/or occupancy.

B. ☐ CERTIFICATE OF CONTINUED OCCUPANCY

This serves notice that based on a general inspection of the visible parts of the building there are no imminent hazards and the building is approved for continued occupancy.

C. ☐ TEMPORARY CERTIFICATE OF OCCUPANCY

If this is a Temporary Certificate of Occupancy the following conditions must be met no later than _____, 19____ or the owner will be subject to a fine or order to vacate:

D. DESCRIPTION OF WORK:

office building

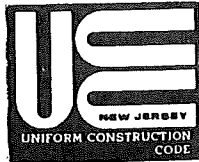
USE GROUP _____ FIRE GRADING _____

MAXIMUM LIVE LOAD _____ MAXIMUM OCCUPANCY LOAD _____

SPECIFIC USE office building

FINAL COST OF CONSTRUCTION: \$ 10,000.

Don Sencelais
CONSTRUCTION OFFICIAL



CERTIFICATE

CERT. NO.	736-88		
DATE ISSUED	8-10-88		
Block	160	Lot	15
Subdivision			

IDENTIFICATION

Owner Alfred J. Giegerich Agent Quality Blders
Address Marvin & New Rd. Address _____
Linwood, N.J. 08221
Tel. (____) _____ Tel. (____) _____
Work Site Address Marvin & New Rd. Lic. No. _____
Federal Emp. No. _____

PAYMENTS

Fees Remitted \$ _____
☐ Check No. _____
☐ Cash _____
☐ Other PREPAID
Collected By: _____
Date: _____

CERTIFICATE OF OCCUPANCY/APPROVAL

A. ☐ CERTIFICATE OF OCCUPANCY

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B. ☐ CERTIFICATE OF CONTINUED OCCUPANCY

This serves notice that based on a general inspection of the visible parts of the building there are no imminent hazards and the building is approved for continued occupancy.

C. ☒ TEMPORARY CERTIFICATE OF OCCUPANCY

If this is a Temporary Certificate of Occupancy the following conditions must be met no later than August 22, 1988 or the owner will be subject to a fine or order to vacate:

D. DESCRIPTION OF WORK:

office building

USE GROUP _____

FIRE GRADING _____

MAXIMUM LIVE LOAD _____

MAXIMUM OCCUPANCY LOAD _____

SPECIFIC USE office building

FINAL COST OF CONSTRUCTION: \$ 10,000.

Don Sullivan
CONSTRUCTION OFFICIAL

FELLOWS, READ & ASSOCIATES, Inc. CONSULTING ENGINEERS, SURVEYORS & PLANNERS
CENTRAL PARK EAST, 222 NEW ROAD, LINWOOD, NEW JERSEY 08221
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Matthew Smith
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R. Bradley Tombs
Robert D. Toscan
Michael G. Zilinski

October 20, 1988

Mayor & Council
City of Linwood
City Hall
400 Poplar Avenue
Linwood, NJ 08221

REF: Giegerich Site Plan
Block 160, Lot 15
F.R.A. File #A00128

Dear Mayor & Council:

We have inspected this project in the field and find that the following work items have been constructed with methods and materials in conformance with City Ordinances and accepted engineering practice. A reduction of surety can therefore be approved for those items as noted on the attached sheet, in the amount of \$14,377.80.

Respectfully submitted,

Fellows, Read & Associates, Inc.


Jonathan E. Rosenkrantz

JER/sr

cc: J. Breidenstine, Sec.
A. Giegerich



CONSTRUCTION PERMIT

PERMIT NO.	736-88
DATE ISSUED	5-6-88
Block	160 Lot 15
Subdivision	

A. IDENTIFICATION

Owner A. Geigensack Agent Quality Builders
Address 107 S. Quincey Address _____
Margate, N.J.
Tel. (____) _____ Tel. (____) _____
Work Site Address Margate Lic. No. _____
New Rd. Federal Emp. No. _____

PAYMENTS

Permit Fee \$ 338.82
Fees Remitted \$ 338.82
☒ Check No. 2869
☐ Cash
☐ Other _____
Collected By: M.M.
Date: 5-6-88

is hereby granted permission
to perform the following work:

- ☒ BUILDING ☒ ELECTRICAL
☒ PLUMBING ☒ FIRE PROTECTION
☐ OTHER _____

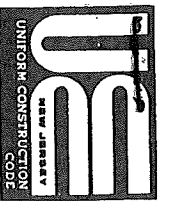
Description of work:

addition

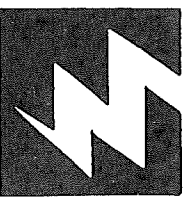
NOTE: If construction does not commence within one (1) year of date of issuance, or if construction ceases for a period of six (6) months, this permit is void.

Estimated Cost of Work: \$ 10,000

Don L. Leland
CONSTRUCTION OFFICIAL



ELECTRICAL SUBCODE



PERMIT NO. 721-88
DATE ISSUED 5-6-88
REVISION DATE _____
Block 160 Lot 15
Subdivision _____

A. IDENTIFICATION

APPLICANT – Complete unshaded areas only

When changing contractors, notify this office

Owner	Alfred J. Gieserich	Contractor	1 Applebee Grill
Address	107 S. Quincy Ave. Margate, N.J. 08402	Address	5 Hammond Dr MAY, CT 06040
Tel. (609)	927 4490	Tel. (603)	625 - 2628
Work Site Address	Marvin & New Road Linwood, N.J.	Lic. No./Bus. Permit	6506
		Federal Emp. No.	159-28 2157

CERTIFICATION IN LIEU OF OATH:

(Complete for Minor Work and Small Job Only)

I hereby certify that the proposed work is authorized by the owner of record and I have been authorized by the owner to make this application as his agent.

AGENT SIGNATURE

B. TECHNICAL SITE DATA

List all wiring and equipment and provide necessary data

No.	Item	Fee	No.	Item	Fee	Fee
9	Switching Outlets	\$		H. V. A. C. Equipment	\$	COLUMN 1 \$
11	Lighting Outlets			Switching Devices		COLUMN 2
11	Receptacle Outlets			Transformers		SUBTOTAL \$
	Range/Oven			Motors/Generators/ Compressors (state no. and size of each)		Minimum Electrical Fee (if applicable) \$
	Dryer, Electric					
	Water Heater, Electric					Total Electrical Fee (Greater of Minimum or Subtotal) \$
	Heating, Electric					
0	Switches					
11	Lighting Fixtures			Other		
11	Receptacles			Other		
11	Bonding, Pool/Vault			Other		
	Service/Feeders			Other		
COLUMN 1		\$	COLUMN 2		\$	

C. ELECTRICAL CHARACTERISTICS

USE GROUP: _____ Present _____ Proposed _____
 Service: _____ Amps _____ Phase _____ System _____
 _____ Wire _____ Volts _____ Wiring _____
 _____ Method _____
 Total No. of Meters: _____
 Estimated Cost of Electrical Work: \$ 2500

D. COMMENTS

☐ Partial Releases ☐ Prototype Processing



FIRE SUBCODE



PERMIT NO.	736-88
DATE ISSUED	5-6-88
REVISION DATE	
Block	Lot
Subdivision	

CERTIFICATION IN LIEU OF OATH:

(Complete for Minor Work and Small Job Only)

I hereby certify that the proposed work is authorized by the owner of record and I have been authorized by the owner to make this application as his agent.

AGENT SIGNATURE

A. IDENTIFICATION

APPLICANT - Complete unshaded areas only

When changing contractors, notify this office

Owner	Alfred J. Giegerich	Contractor	
Address	107 S. Quincy Ave., Margate, N.J. 08401	Address	
Tel. (609)	927 4490	Tel. ()	
Work Site Address	Marvin & New Road Linwood, N.J.	Lic. No.	
		Federal Emp. No.	

B. TECHNICAL SITE DATA

B1. SPRINKLERS

TYPE: ☐ Wet ☐ Dry ☐ Other	FEE
Area Sprinkled: ☐ Full ☐ Partial (specify in comments)	
No. of Heads: _____	No. of Spare Heads: _____
☐ Valves Supervised - Method: _____	Size: _____
Water Supply - Source: _____	FD Connection Location: _____
Estimated Cost of Work: \$ _____	\$ _____

B2. SPECIAL SUPPRESSION SYSTEMS

TYPE: ☐ Dry Chemical ☐ CO ₂	
☐ Halon ☐ Foam	
☐ Other _____	
Manual Pull: ☐ Yes ☐ No	
Locations: _____	
Estimated Cost of Work: \$ _____	\$ _____

B3. ALARM

TYPE: ☐ Manual ☐ Automatic	FEE
Supervision Type: ☐ Local ☐ Central	
☐ Proprietary ☐ Remote Location	
Estimated Cost of Work: \$ _____	\$ _____

B4. STAND PIPES

Pipe Size: _____	Pump Size: _____
Water Source: _____	Size: _____
FD Connection Location: _____	
Hose Station: ☐ Yes ☐ No	
Estimated Cost of Work: \$ _____	\$ _____

B5. OTHER

\$ _____	\$ _____
\$ _____	\$ _____
\$ _____	\$ _____

Subtotal

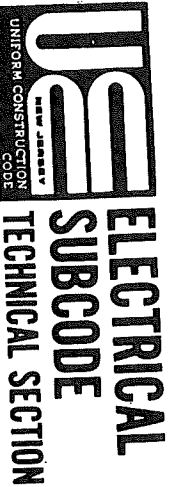
Minimum Fire Protection Fee (If Applicable)	\$ _____
Total Fire Protection Fee (Greater of Minimum or Subtotal)	\$ _____

C. FIRE PROTECTION CHARACTERISTICS

USE GROUP _____	Present _____	Proposed _____
Heating Systems - Location: _____		
Type: ☐ Gas ☒ Oil ☐ Electrical ☐ Solar ☐ Other _____		
Fuel Storage Tank - Location: _____	Fuel Type: _____	Capacity: _____
Total Estimated Cost of Fire Protection Work: \$ _____		

D. COMMENTS

☐ Partial Releases	☐ Prototype Processing
---	---



PERMIT NO. 120-88
DATE ISSUED 5-6-88
REVISION DATE _____
Block 160 Lot 15
Subdivision _____

A. IDENTIFICATION

APPLICANT - Complete unshaded areas only

When changing contractors, notify this office

Owner Alfred J. Giegerich
Address 107 S. Quincy Ave.,
Margate, N.J. 08402

Contractor LARSEN GROSS
Address 5 Monmouth Dr
MAYSVILLE OH

Tel. (609) 927 4490
Tel. (609) 625-2628

Work Site Address Marvin & New Road
Linwood, N.J.

Lic. No./Bus. Permit. 6506
Federal Emp. No. 157-28 E157

CERTIFICATION IN LIEU OF OATH:
(Complete for Minor Work and Small Job Only)

I hereby certify that the proposed work is authorized by the owner of record and I have been authorized by the owner to make this application as his agent

[Signature]
AGENT SIGNATURE

B. TECHNICAL SITE DATA

List all wiring and equipment and provide necessary data

TYPE OF WORK:		TYPE OF WORK:	
No.	Item	No.	Item
9	Switching Outlets		H.V.A.C. Equipment
16	Lighting Outlets		Switching Devices
16	Receptacle Outlets		Transformers
	Range/Oven		Motors/Generators/Compressors (state no. and size of each)
	Dryer, Electric	1	2.5 Ton Air Cond
	Water Heater, Electric		Other
	Heating, Electric		Other
9	Switches		Other
16	Lighting Fixtures		Other
16	Receptacles		Other
	Bonding, Pool/Vault		Other
	Service/Feeders		Other

COLUMN 1 \$
COLUMN 2 \$

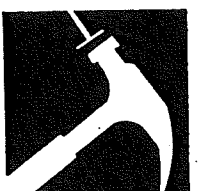
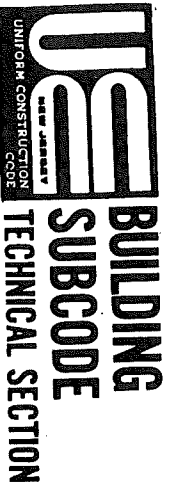
COLUMN 1 \$
SUBTOTAL \$
Minimum Electrical Fee (if applicable) \$
Total Electrical Fee (Greater of Minimum or Subtotal) \$

C. ELECTRICAL CHARACTERISTICS

USE GROUP: _____ Present _____ Proposed _____
Service: _____ Amps _____ Phase _____ System _____
Wire _____ Volts _____ Wiring Method _____
Total No. of Meters: _____
Estimated Cost of Electrical Work: \$ 2500

D. COMMENTS

☐ Partial Releases ☐ Prototype Processing



PERMIT NO. 736-88
DATE ISSUED 5-6-88
REVISION DATE _____
Block 160 Lot 15
Subdivision _____

A. IDENTIFICATION

APPLICANT - Complete unshaded areas only

Owner Alfred J. Giegerich

Contractor Quality Builders

Address 107 S. Quincey Ave.,

Address Margate, N.J. 08402

Tel. (609) 927 4490

Tel. (609) 927 4490

Work Site Address Marvin & New Road

Linwood, N.J. 08221

When changing contractors, notify this office

Address 1321 W. Mill Rd

Address Northfield NJ

Tel. (609) 641-4494

Lic. No. _____

Federal Emp. No. 22-2560018

CERTIFICATION IN LIEU OF OATH:
(Complete for Minor Work and Small Job Only)

I hereby certify that the proposed work is authorized by the owner of record and I have been authorized by the owner to make this application as his agent.

[Signature]
AGENT SIGNATURE

B. TECHNICAL SITE DATA

DESCRIPTION OF WORK
Give detail description including materials used, dimensions, etc.

Construct Addition and Alteration to Existing Building as per Plans.

☒ See Plans

TYPE OF WORK:

☐ New Building

☒ Addition

☒ Alteration/Renovation

☐ Roofing

☐ Siding

☐ Other _____

☐ Demolition

☐ Miscellaneous

☐ Fence

☐ Sign

☐ Pool

☐ Elevator

☐ Other _____

Fee Basis	Fee
Minimum Building Fee (if applicable)	\$ _____
Total Building Fee (Greater of Minimum or Subtotal)	\$ _____
SUBTOTAL	\$ _____

C. BUILDING CHARACTERISTICS

USE GROUP: _____ Present _____ Proposed _____

No. of Stories 1 Total Building Area-All Floors _____ Sq. Ft.

Height of Structure 15 Ft. Volume of Structure _____ Cu. Ft.

Area-Largest Floor _____ Sq. Ft. Total Land Area Disturbed _____ Sq. Ft.

Estimated Cost of Building Work: \$ 60,000

D. COMMENTS

See Plans

☐ Partial Releases ☐ Prototype Processing

PLUMBING **SUBCODE** **TECHNICAL SECTION**



PERMIT NO. 136-88
 DATE ISSUED 8-6-88
 REVISION DATE _____
 Block 160 Lot 15
 Subdivision _____

A. IDENTIFICATION

APPLICANT - Complete unshaded areas only
 When changing contractors, notify this office

Owner Alfred J. Giegerich
Address 107 S. Quincy Ave.,
Margate, N.J. 08401
Tel. (609) 927 4490
Work Site Address Marvin & New Road
Linwood, N.J.

Contractor DAVID TILLEY
Address 515 Richmond
Piscataway NJ
Tel. (609) 8846
Lic.No./Bus. Permit 10989
Federal Emp. No. 138 50 1899

CERTIFICATION IN LIEU OF OATH:
 (Complete for Minor Work and Small Job Only)
 I hereby certify that the proposed work is authorized by the owner of record and I have been authorized by the owner to make this application as his agent.
David Tilley
 AGENT SIGNATURE

B. TECHNICAL SITE DATA

List all fixtures

TYPE OF WORK:

No.	Fixture	Fee	No.	Fixture	Fee	Fee
1	Water Closet/Bidet/Urinal	\$ 32.50	1	Garbage Disposal	25.00	COLUMN 1 \$ 32.50
	Bathrub			Air Conditioner Unit		COLUMN 2 \$ 22.50
1	Lavatory/Sink			Indirect Connection		SUBTOTAL \$ 115.00
	Shower/Floor Drain			Sewer Ejector		Minimum Plumbing Fee (if applicable) \$
	Washing Machine			Grease Trap		Total Plumbing Fee (Greater of Minimum or Subtotal) \$
	Dishwasher			Interceptor		
	Commercial Dishwasher			Backflow Device		
	Water Heater			Reduced Pressure Backflow Device		
	Domestic Boiler/Furnace		1	Vent Stack		
	Steam Boiler			Solar System		
	Water Util. Connection			Other <u>Plum Rev</u>	15.00	
	Sewer Util. Connection			Other <u>WASH</u>	32.50	
	Hose Bibb			Other		
	Water Cooler			Other		
COLUMN 1		\$ 32.50	COLUMN 2		\$ 22.50	

C. PLUMBING CHARACTERISTICS

USE GROUP: _____ **Present** _____ **Proposed** _____

Drainage - Material Plastic Size 3"
 Building Sewer - Material Copper Size 1 1/2"
 Water Service - Material Plastic Size 1 3/4"
 Venting - Material _____ Size _____
 Estimated Cost of Plumbing Work: \$ 1000

D. COMMENTS

☐ Partial Releases ☐ Prototype Processing

SUBCODES AND SPECIAL REGULATIONS APPLICABLE:

U.C.C. Form F-100 (8/83)

Updated at time of receipt of drawings and when plans are approved.

☐ PARTIAL RELEASES ☐ PROTOTYPE PLAN - FILE LOCATION AND NO.

Updated at time of permit and after final approvals.

Issue Date	Category	Revised
------------	----------	---------

CERTIFICATES TO BE ISSUED:

☐ Temporary Certificate of Occupancy

On-going Inspections Required
(See Page 1, I.D.)

Date Posted to Log and Ticker

A. COLLECTED AT TIME OF CONSTRUCTION PERMIT

Initial fee collection recorded in A; all others in section B.

ISSUANCE

AMOUNT

115.00

73

25.

$$\left(\frac{1}{\sqrt{2}} \right)$$

25

58. 022

2000 \$

MIT ISSUANCE

AMOUNT

5

③ \$

INTOWA

AMOUNT \$



CONSTRUCTION PERMIT APPLICATION

I. IDENTIFICATION

1. Proposed Work at: _____
2. Owner Name: AL GIEGRICH Tel. (____) _____
- Address 200 New Rd Linwood
3. Principal Contractor: MC AJUSTER EMBLS Tel. (____) _____
- Address 0410 Ave ATL CITY
- Lic. No. or Builder Reg. No. _____ Federal Emp. No. _____
4. Architect or Engineer: _____ Tel. (____) _____
- Address _____
5. Responsible Person in Charge of Work JIM STAPLETON Tel. (____) _____

II. PROPOSED WORK

A. TYPE OF WORK

1. ☐ Minor Work (Single Trade)
2. ☐ Small Job (\$5,000 and no Prior Approvals)
Complete only II.B., III and IV.A. and Page 2
3. ☐ New Building
4. ☐ Addition
5. ☐ Alteration
6. ☒ Repair, Replacement
7. ☐ Demolition
8. ☐ Other: _____

B. CATEGORIES OF WORK

Permit/Category	Estimated
1. ☐ Building/Structural	\$ _____
2. ☐ Plumbing	_____
3. ☐ Electrical	_____
4. ☐ Fire Protection	_____
5. ☐ Other <u>Heater</u>	_____
6. ☐ Other _____	_____
TOTAL COST \$ <u>14500</u>	

C. DO YOU WANT:

1. ☐ Partial Releases 2. ☐ Prototype Processing

D. DOES OR WILL YOUR BUILDING CONTAIN ANY OF THE FOLLOWING?

1. ☐ Elevators/Dumbwaiters
2. ☐ High-Pressure Boilers
3. ☐ Refrigeration Systems
4. ☐ Pressure Vessels
5. ☐ Hazardous Uses/Places of Assembly
6. ☐ Cross-connections/Backflow Preventors
7. ☐ Sprinklers
8. ☐ Smoke Control Systems in Open Wells

III. DESCRIPTION OF BUILDING USE (USE GROUPS)

A. RESIDENTIAL

1. ☐ Hotels (R-1) If new construction, enter no. of dwelling units _____
2. ☐ Multi-Family (R-2) HMD Reg. No.: _____
3. ☐ Two Family (R-3b) If other than new construction, enter no. of dwelling units: _____
4. ☐ One-Family (R-3a) Before Construction: _____
- After Construction: _____
- Net Gain (or loss): _____

B. NON-RESIDENTIAL

5. ☐ Theatres with Stage (A-1-A)
6. ☐ Movie Theatres (A-1-B)
7. ☐ Night Clubs (A-2)
8. ☐ Restaurants, Libraries, Museums (A-3)
9. ☐ Religious Assembly (A-4)
10. ☐ Outdoor Assembly (A-5)
11. ☐ Business (B)
12. ☐ Educational (E)
13. ☐ Moderate-Hazard Factory (F-1)
14. ☐ Low-Hazard Factory (F-2)
15. ☐ High-Hazard (H)
16. ☐ Institutional Detention Center (I-1)
17. ☐ Hospitals, Infirmeries (I-2)
18. ☐ Group Homes (I-3)
19. ☐ Mercantile (M)
20. ☐ Moderate-Hazard Warehouse (S-1)
21. ☐ Low-Hazard Warehouse (S-2)
22. ☐ Temporary, Misc. (U)
23. ☐ Other _____

State Specific Use: _____

If Change in Use Group, Indicate Former: _____

IV. BUILDING CHARACTERISTICS

A. OWNERSHIP

1. ☐ Private (Individual, Corp., Non-profit Inst., Etc.)
2. ☐ Public (State, County or Local Govt.)

B. HEATING FUEL

Principal	Secondary	Type
3. ☐	☐	Gas
4. ☐	☒	Oil
5. ☐	☐	Electric
6. ☐	☐	Solid (Wood, Coal, Etc.)
7. ☐	☐	Propane
8. ☐	☐	Solar
9. ☐	☐	Other _____

C. TYPE OF SEWAGE DISPOSAL

10. ☐ Public or Private Company
11. ☐ Private (Septic Tank, Etc.)

D. TYPE OF WATER SUPPLY

12. ☐ Public or Private Company
13. ☐ Private (Well, Etc.)

E. BUILDING CHARACTERISTICS

14. No. of Stories _____
15. Height of Structure _____ Ft.
16. Area—Largest Floor _____ Sq. Ft.
17. Bldg. Area—All Fls. _____ Sq. Ft.
18. Volume of Structure _____ Cu. Ft.
19. Total Land Area Disturbed _____ Sq. Ft.

CERTIFICATION IN LIEU OF OATH

I. OWNER SECTION

I hereby certify that I am the owner of the property listed on Page 1. This dwelling is to be occupied by myself and is not to be used for any purpose, other than single family residential use.

- A. ☐ I further certify that I prepared the plans submitted. This statement is made in accordance with the New Jersey Uniform Construction Code, N.J.A.C. 5:23-2.15(e)vii.
- B. ☐ I further certify that I will perform the work below.
B1. ☐ Building B2. ☐ Electrical B3. ☐ Plumbing
- C. ☐ I further certify that a new home will be constructed on this property, for my use and occupancy. I attest that all design, construction, plumbing, or electrical work will be done by me or by subcontractors under my supervision, in accordance with all applicable laws; and further acknowledge that said new home is not covered under the New Home Warranty and Builders Registration Act (N.J.A.C. 46:3B-1 et. seq.) and that such fact shall be disclosed to any person purchasing this property within ten years of the date of issuance of a certificate of occupancy.
- D. ☐ I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I understand that if any of the above statements are willfully false, I am subject to punishment.

SIGNATURE _____ DATE _____

II. AGENT SECTION

I hereby certify that the work is authorized by the owner of record and I have been authorized by the owner to make this application as his agent.

I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I understand that if any of the above statements are willfully false, I am subject to punishment.

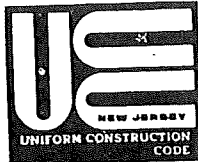
☐ Check if contractor.

AGENT NAME _____ TEL. () _____

ADDRESS _____

SIGNATURE

H James Stapleton



CONSTRUCTION PERMIT

PERMIT NO. 19-84
DATE ISSUED 5-14-84
Block 160 Lot 15
Subdivision _____

A. IDENTIFICATION

Owner A. Geigrich Agent McAllister Fuels
Address 210 New Rd. Address _____
Linwood, N.J.
Tel. (____) 210 New Rd. Tel. (____) _____
Work Site Address _____ Lic. No. _____
Federal Emp. No. _____

PAYMENTS

Permit Fee \$ 15.00
Fees Remitted \$ 15.00
☐ Check No. _____
☒ Cash
☐ Other _____
Collected By: M. M.
Date: 5-14-84

is hereby granted permission
to perform the following work:

- ☐ BUILDING ☐ ELECTRICAL
☐ PLUMBING ☐ FIRE PROTECTION
☒ OTHER oil heater

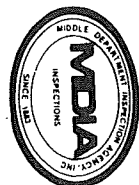
Description of work:

heater replacement

NOTE: If construction does not commence within one (1) year of date of issuance, or if construction ceases
for a period of six (6) months, this permit is void.

Estimated Cost of Work: \$ 1450.

[Signature]
CONSTRUCTION OFFICIAL



MIDDLE DEPARTMENT INSPECTION AGENCY, INC.

NATIONAL HEADQUARTERS

900 HADDON AVE. COLLINGSWOOD, NJ 08108
609-858-4400

PLUMBING SUBCODE TECHNICAL SECTION

PERMIT NO. 79-84
DATE ISSUED 5-14-84
REVISION DATE _____

Block 140 Lot 15
Subdivision _____

A. IDENTIFICATION

APPLICANT - Complete unshaded areas only

When changing contractor's, notify this office

Owner AL Gierack

Address 200 Howard

Tel. () _____

Work Site Address Same

Contractor MC Waters Inc

Address 412 City

Tel. () 345-2231

Lic. No./Bus. Permit 21-05-10430

Federal Emp. No. _____

CERTIFICATION IN LIEU OF OATH:

(Complete for Minor Work and Small Job Only)

I hereby certify that the proposed work is authorized by the owner of record and I have been authorized by the owner to make this application as his agent.

W. Stapleton
AGENT SIGNATURE

B. TECHNICAL SITE DATA

List all fixtures

TYPE OF WORK:

No.	Fixture	Fee	No.	Fixture	Fee
	Water Closer/Bidet/Urinal	\$		Garbage Disposal	\$
	Bathrub			Air Conditioner Unit	
	Lavatory/Sink			Indirect Connection	
	Shower/Floor Drain			Sewer Ejector	
	Washing Machine			Grease Trap	
	Dishwasher			Interceptor	
	Commercial Dishwasher			Backflow Device	
	Water Heater			Reduced Pressure	
	Domestic Boiler/Furnace			Backflow Device	
	Steam Boiler			Vent Stack	
	Water Util. Connection			Solar System	
	Sewer Util. Connection			Other <u>WATER</u>	
	Hose Bibb			Other <u>REPLACEMENT</u>	
	Water Cooler			Other _____	

COLUMN 1

COLUMN 2

COLUMN 1 Fee \$
COLUMN 2 Fee \$
SUBTOTAL \$
Minimum Plumbing Fee (if applicable) \$
Total Plumbing Fee (Greater of Minimum or Subtotal) \$

C. PLUMBING CHARACTERISTICS

USE GROUP: _____ Present _____ Proposed _____

Drainage - Material _____ Size _____

Building Sewer - Material _____ Size _____

Water Service - Material _____ Size _____

Venting - Material _____ Size _____

Estimated Cost of Plumbing Work: \$ 1450.00

D. COMMENTS

☐ Partial Releases ☐ Prototype Processing

OFFICE COPY

PERMIT CONTROL

I. PLAN REVIEW STATUS

Updated at time of receipt of drawings and when plans are approved.

☐ PARTIAL RELEASES

☐ PROTOTYPE PLAN — FILE LOCATION AND NO. _____

Plan Review Required	Type of Work	Plans Received By Date	Receiver	Approval Date	Reviewer	Comments
☐	BUILDING					
	Footings/Foundations					
	Framing					
	Architectural					
	Other _____					
☐	PLUMBING					
☐	ELECTRICAL					
☐	FIRE PROTECTION					
☐	OTHER _____					

II. PERMIT/INSPECTION STATUS

Updated at time of permit and after final approvals.

Issue Date	Category	Revisions	Final Inspection	Comments
_____	ALL CONSTRUCTION			
_____	BUILDING			
_____	Footings/Foundations			
_____	Framing			
_____	Architectural			
_____	Other _____			
_____	PLUMBING			
_____	ELECTRICAL			
_____	FIRE PROTECTION			
_____	OTHER _____			

III. CERTIFICATES ISSUED

CERTIFICATES TO BE ISSUED:

Date Issued

- ☐ Temporary Certificate of Occupancy
Date Expired _____
- ☐ Temporary Certificate of Occupancy
Date Expired _____
- ☐ Certificate of Occupancy
No. _____
- ☐ Certificate of Continued Occupancy
No. _____
- ☐ Certificate of Approval
No. _____
- ☐ None

IV. ON-GOING INSPECTIONS

On-going Inspections Required
(See Page 1, II.D.)

Date Posted to
Log and Tickler

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

V. FEE SUMMARY

Initial fee collection recorded in A; all others in section B.

A. COLLECTED AT TIME OF CONSTRUCTION PERMIT ISSUANCE

	AMOUNT
BUILDING	\$ _____
PLUMBING	_____
ELECTRICAL	_____
FIRE PROTECTION	_____
OTHER <u>Heat</u>	<u>1.50</u>
SUBTOTAL	\$ _____
— LESS: 20% of subtotal (when plan review performed by state agency).	
	(_____)
D.C.A. TRAINING FEE .0006 x _____	= _____
CERTIFICATE OF OCCUPANCY	_____
OTHER _____	_____
OTHER _____	_____
TOTAL COLLECTED WHEN PERMIT ISSUED	\$ <u>1.50</u>
DATE _____	Collected By _____

B. COLLECTED AFTER CONSTRUCTION PERMIT ISSUANCE

Date	Collected By	AMOUNT
CERTIFICATE OF OCCUPANCY	_____	_____
OTHER	_____	_____
OTHER	_____	_____
— LESS: Refunds		(_____)
TOTAL COLLECTED AFTER PERMIT ISSUED		\$ _____

C. TOTAL CONSTRUCTION FEES COLLECTED

	AMOUNT
COLLECTED WITH PERMIT (VA)	\$ _____
COLLECTED AFTER PERMIT (VB)	_____
TOTAL	\$ _____

PERMIT NO.

PRIOR APPROVALS CHECKLIST

[illegible]

SUBCODES AND SPECIAL REGULATIONS APPLICABLE:

EDITION OF CODE

EDITION OF CODE

☐ Flood Hazard

- ☐ One and Two Family Dwellings
- ☐ Building
- ☐ Electrical
- ☐ Plumbing

- ☐ Mechanical
 - ☐ Energy
 - ☐ Barrier Free
 - ☐ Other

- ☐
- As Built
-
- Elevation
-
- Certification

- ☐
- Other

CITY of LINWOOD & SOMERS POINT

550 HAMILTON AVE.
LINWOOD, N.J. 08221

LINWOOD

CITY

APPLICATION FOR PLAN EXAMINATION AND CONSTRUCTION PERMIT

IMPORTANT - Applicant to complete all items in sections: I, II, III, IV, and IX.

I. LOCATION OF BUILDING	AT (LOCATION) <u>200 210 New Road</u> (NO.) (STREET)	ZONING DISTRICT _____
	BETWEEN <u>COR. MARVIN AVE & New Rd.</u> (CROSS STREET) AND _____ (CROSS STREET)	
	SUBDIVISION _____	LOT <u>15</u> BLOCK <u>160</u> LOT SIZE _____

II. TYPE AND COST OF BUILDING - All applicants complete Parts A - D

A. TYPE OF IMPROVEMENT

- 1 ☐ New building
- 2 ☐ Addition *If residential, enter number of new housing units added, if any, in Part D, 13*
- 3 ☒ Alteration *(See 2 above)*
- 4 ☐ Repair, replacement
- 5 ☐ Wrecking *(If multifamily residential, enter number of units in building in Part D, 13)*
- 6 ☐ Moving (relocation)
- 7 ☐ Foundation only

D. PROPOSED USE - For "Wrecking" most recent use.

Residential

- 12 ☐ One family
- 13 ☐ Two or more family - Enter number of units - _____
- 14 ☐ Transient hotel, motel, or dormitory - Enter number of units - _____
- 15 ☐ Garage
- 16 ☐ Carport
- 17 ☐ Fence
- 18 ☐ Other - Specify _____

Nonresidential

- 18 ☐ Amusement, recreational
- 19 ☐ Church, other religious
- 20 ☐ Industrial
- 21 ☐ Parking garage
- 22 ☐ Service station, repair garage
- 23 ☐ Hospital, institutional
- 24 ☒ Office, bank, professional
- 25 ☐ Public utility
- 26 ☐ School, library, other educational
- 27 ☐ Stores, mercantile
- 28 ☐ Tanks, towers
- 29 ☐ Restaurant
- 30 ☐ Other - Specify _____

B. OWNERSHIP

- 8 ☒ Private (individual, corporation, nonprofit institution, etc.)
- 9 ☐ Public (Federal, State, or local government)

C. PHYSICAL VALUE

- 10.A. Building \$ _____
- B. Electrical \$ _____
- C. Plumbing \$ _____
- D. Heating, air conditioning \$ _____
- E. Other (elevator, etc.) \$ _____

(Omit cents)

Nonresidential - Describe in detail proposed use of buildings, e.g., food processing plant, machine shop, laundry building at hospital, elementary school, secondary school, college, parochial school, parking garage for department store, rental office building, office building at industrial plant. If use of existing building is being changed, enter proposed use.

INSURANCE OFFICE

11. TOTAL COST OF IMPROVEMENT \$ 1500.00

III. SELECTED CHARACTERISTICS OF BUILDING - For new buildings and additions, complete Parts E - L; for wrecking, complete only Part J, for all others skip to IV.

E. PRINCIPAL TYPE OF FRAME

- 30 ☒ Masonry (wall bearing)
- 31 ☒ Wood frame
- 32 ☐ Structural steel
- 33 ☐ Reinforced concrete
- 34 ☐ Other - Specify _____

G. TYPE OF SEWAGE DISPOSAL

- 40 ☐ Public or private company
- 41 ☐ Private (septic tank, etc.)

H. TYPE OF WATER SUPPLY

- 42 ☐ Public or private company
- 43 ☐ Private (well, cistern)

J. DIMENSIONS

48. Number of stories
49. Total square feet of floor area, all floors, based on exterior dimensions.
50. Total land area, sq. ft.

K. NUMBER OF OFF-STREET PARKING SPACES

51. Enclosed
52. Outdoors

L. RESIDENTIAL BUILDINGS ONLY

53. Number of bedrooms
54. Number of bathrooms { Full
Partial

F. PRINCIPAL TYPE OF HEATING FUEL

- 35 ☐ Gas
- 36 ☐ Oil
- 37 ☐ Electricity
- 38 ☐ Solar
- 39 ☐ Other - Specify _____

I. TYPE OF MECHANICAL

- Will there be central air conditioning?
- 44 ☐ Yes
 - 45 ☐ No
- Will there be an elevator?
- 46 ☐ Yes
 - 47 ☐ No

DESCRIPTION OF WORK AND USE OF CONSTRUCTION

Relocate FRONT WINDOW, Remove END WALL WINDOW & close up
build 6' WALL INSIDE PORCH TO CREATE Foyer - INSTALL INT. DOOR
& FRAME.

ELECTRICAL

Name of Contractor

Address

N.J. State License No.

Tele. No.

PLUMBING AND HEATING

Name of Contractor

Address

N.J. State License No.

Tele. No.

IV. IDENTIFICATION - To be completed by all applicants				
Name		Mailing address - Number, street, city, and State	ZIP code	Tel. No.
1. Owner or lessee	A. Geigerich & Son	200 New Road		927-4490
2. Contractor	VAN DUYN BROS.	507-A BARR AVE LINWOOD	08221	927 3466
3. Architect or Engineer				

N.J.A.C. 5:23-2.5 REVOCATION OF PERMITS: The construction official may revoke a permit or approval issued under the provision of this code in case of any false statement or misrepresentation of fact in the application or on the plans on which the permit or approval was based.

Signature of applicant	Address	Application date
<i>Samuel Van Duyn</i>	507-A BARR AVE LINWOOD	10/19/83

V. PLAN REVIEW RECORD - For office use						
Plans Review Required	Plan Review Fee	Date Plans Started	By	Date Plans Approved	By	Notes
BUILDING	\$ 15.00					
PLUMBING	\$					
MECHANICAL	\$					
ELECTRICAL	\$					
CERTIFICATE OF OCCUPANCY	\$					
N.J. SUR. CHARGE	\$					
TOTAL FEES	\$ 15.00					

VI. ADDITIONAL PERMITS REQUIRED OR OTHER APPROVALS		Number	By
	Date Obtained		
Zoning Board			
Planning Board			
Soil Erosion and Sediment Control			
Dept. of Transportation			
Dept. of Health			
Dept. of Environmental Protection			
Coastal and Waterfront Development			
Flood Hazard Area			

VII. VALIDATION	
Const. Permit number _____	FOR DEPARTMENT USE ONLY Use Group _____ Fire Grading _____ Live Loading _____ Occupancy Load _____
Const. Permit issued _____ 19 _____	
Const. Permit Fee \$ _____	
Certificate of Occupancy \$ _____	
Plan Review Fee \$ _____	
Approved: <i>[Signature]</i> _____ CONSTRUCTION OFFICIAL	

LINWOOD-SOMERS POINT, N.J.
BUILDING DEPARTMENT
(609)-653-8074

CERTIFICATE OF OCCUPANCY
DATE 15.00
BUILDING PERMIT -
CERTIFICATE OF OCCUPANCY
83 321-83

10-20

APPLICANT A. Geigerich DATE 10-20 1983 PERMIT NO. 321-83
ADDRESS 210 New Rd. (NO.) (STREET) (CONTR'S LICENSE)

PERMIT TO alteration (TYPE OF IMPROVEMENT) (NO.) STORY (PROPOSED USE) NUMBER OF DWELLING UNITS

AT (LOCATION) 210 New Rd. (NO.) (STREET) ZONING DISTRICT

BETWEEN (CROSS STREET) AND (CROSS STREET)

SUBDIVISION LOT 15 BLOCK 160 LOT SIZE

BUILDING IS TO BE FT. WIDE BY FT. LONG BY FT. IN HEIGHT AND SHALL CONFORM IN CONSTRUCTION

TO TYPE alteration USE GROUP BASEMENT WALLS OR FOUNDATION (TYPE)

REMARKS:

AREA OR VOLUME (CUBIC/SQUARE FEET)

OWNER A. Geigerich

ADDRESS 210 New Rd.

ADDRESS



TO BE POSTED ON PREMISES
SEE REVERSE SIDE FOR CONDITIONS OF CERTIFICATE

LINWOOD-SOMERS POINT, N.J.
BUILDING DEPARTMENT
(609)-653-8074

BUILDING PERMIT
15.00

10-20

83

321-83

APPLICANT A. Geigerich DATE 10-20 1983 PERMIT NO. 321-83
ADDRESS 210 New Rd. (NO.) (STREET) (CONTR'S LICENSE)

PERMIT TO alteration (TYPE OF IMPROVEMENT) (NO.) STORY (PROPOSED USE) NUMBER OF DWELLING UNITS

AT (LOCATION) 210 New Rd. (NO.) (STREET) ZONING DISTRICT

BETWEEN (CROSS STREET) AND (CROSS STREET)

SUBDIVISION LOT 15 BLOCK 160 LOT SIZE

BUILDING IS TO BE FT. WIDE BY FT. LONG BY FT. IN HEIGHT AND SHALL CONFORM IN CONSTRUCTION

TO TYPE alteration USE GROUP BASEMENT WALLS OR FOUNDATION (TYPE)

REMARKS:

AREA OR VOLUME (CUBIC/SQUARE FEET)

OWNER A. Geigerich

ADDRESS 210 New Rd.

ADDRESS

ESTIMATED COST \$ 1500. PERMIT FEE \$ 15.00

BUILDING DEPT BY Allen R. Smith



NEW JERSEY
UNIFORM CONSTRUCTION
CODE

Applicant Completes: Sections I, II, III (optional), IV, VI, and VIII

I. IDENTIFICATION *100 to 1, 1200*

1. Proposed Work Site at: 100 New Road
2. Name of Owner in Fee: ELEMA KASHI/Michael Caruso

Tel. (401) 431-6730 e-mail _____
Address 201 New Road, Limerick, NJ 08201
zip code _____

3. Ownership in Fee: Public _____ Private Y

4. Principal Contractor: Mercury Solar Systems Tel. (609) 625-0074

Address 6390 Harding Highway, Mays Landing, NJ 08330 e-mail paello@mercurysolarsystems.com

License No. OR, if new home, Builder Reg. No. _____ Exp. Date _____

Federal Emp. ID No. 26-2959669 Fax: (609) 837-2487

Address 6330 Harding Highway, Mays Landing, NJ 08330 e-mail _____
Tel (609) 625-0074 Fax: (609) 837-2487

6. Responsible Person in Charge once Work has Begun
Philip Alario
 Tel. (609) 625-0074
 Fax: (609) 837-2487

RA			
☐ Minor Work	☐ New Building	☐ Addition	☐ Demolition
☐ Repair	☐ Alteration	☐ Renovation	☐ Reconstruction
☐ Asbestos Abat. - Subch. 8	☐ Lead Hazard Abatement	☐ Radon Remediation	☐ Annual Permit

[illegible]

IV. DOES OR WILL YOUR BUILDING CONTAIN ANY OF THE FOLLOWING?

1. ☐ Partial Releases
2. ☐ Prototype Processing

1. Building	\$	114	
2. Electrical			
3. Plumbing		232	
4. Fire Protection			
5. Elevator Devices			
6. Subtotal			
7. Less 20% for State Plan Review	\$		
8. Subtotal	\$	71	
9. State Permit Surcharge Fee			
10. Subtotal	\$		
11. Cert. of Occupancy			
12. Other 200004 - AD & SD -			
13. TOTAL	\$	419.7	

1. Number of Stories _____
2. Height of Structure _____ ft.
3. Area — Largest Floor _____ sq. ft.
4. New Building Area _____ sq. ft.
5. Volume of New Structure _____ cu. ft.
6. Max. Live Load _____
7. Max. Occupancy Load _____
8. If Industrialized Building: State Approved _____ HUD _____
9. Total Land Area Disturbed _____ sq. ft.
10. Flood Hazard Zone _____
11. Base Flood Elevation _____ ft.
12. Wetlands yes _____ no _____

A. RESIDENTIAL (*primary use*)

1. State Specific Use: _____
2. Use Group, Proposed: _____
3. Change in Use Group, Indicate Present: _____
4. No. of dwelling units: Total Units Income-restricted

Gained, Sale	_____	_____	_____
Gained, Rental	_____	_____	_____
Lost, Sale	_____	_____	_____
Lost, Rental	_____	_____	_____

B. NON-RESIDENTIAL (*primary use*)

1. State Specific Use: _____
2. Use Group, Proposed: _____
3. Change in Use Group, Indicate Present: _____

C. MIXED USE - List secondary use(s): _____

D. Construct. Classification: Present _____

Proposed _____

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CERTIFICATION IN LIEU OF OATH

I. OWNER SECTION (to be completed if the applicant is the owner in fee)

I hereby certify that I am the owner in fee of the property listed on Page 1.

Mark the following applicable boxes:

- A. ☐ I further certify that a new home (private residence) will be constructed on this property for my own use and occupancy. This dwelling is to be occupied by myself and is not to be used for any purpose other than single family residential use. I attest that all construction, plumbing, or electrical work will be done, in whole or in part, by me or by subcontractors under my supervision, in accordance with all applicable laws; and, I further acknowledge that said new home is not covered under the New Home Warranty and Builders Registration Act (N.J.S.A. 46:3B-1 et seq.) and that such fact shall be disclosed to any person purchasing this property within ten years of the date of issuance of a certificate of occupancy.

I UNDERSTAND THAT IN MARKING BOX A, I ACKNOWLEDGE THAT I AM ASSUMING RESPONSIBILITY FOR THE WORK DONE ON SAID PROPERTY, THE CONDITION OF THE PROPERTY PRIOR TO, DURING, AND AFTER ANY WORK PERFORMED, AND FOR THE PERFORMANCE OF THE SUBCONTRACTORS I HIRE, EMPLOY, OR OTHERWISE CONTRACT OR WITH WHOM I MAKE AGREEMENTS TO PERFORM WORK. I AM VOLUNTARILY AND KNOWINGLY ASSUMING THIS RESPONSIBILITY.

- B. ☐ I further certify the following as required by the New Jersey Uniform Construction Code, N.J.A.C. 5:23-2.15(f)1.ix:

I personally prepared the plans submitted for: 1) the new home referred to in A.; or, 2) an addition, alteration, renovation, or repair to an existing single family residence owned and occupied by myself and located on the property listed on Page 1; or, 3) a new structure that will be physically separate from, but that will be deemed part of, an existing single family residence that is owned and occupied by myself and located on the property listed on Page 1.

- C. ☐ I further certify that I will perform or supervise the following work:

C.1. ☐ Building C.2. ☐ Fire Protection

I further certify that I will perform the following work:

C.3. ☐ Electrical C.4. ☐ Plumbing

- D. ☐ I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals have been given, including such certification as the construction official may require.

I understand that if any of the above statements are willfully false, I am subject to punishment.

Signature _____ Date _____

II. AGENT SECTION (to be completed if the applicant is not the owner in fee)

I hereby certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(d): the proposed work is authorized by the owner in fee; and I have been authorized by the owner in fee to make this application as his agent.

I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals have been given, including such certification as the construction official may require.

I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I understand that if any of the above statements are willfully false, I am subject to punishment.

☒ Check if contractor.

Agent Name Mercury Solar Systems

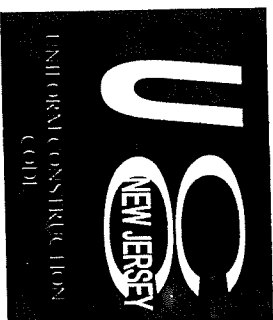
Address 6390 Harding Highway, Mays Landing, NJ 08330

Telephone (609) 625-0074

Signature _____

Merissa Hambleton

- III. ☐ LEAD HAZARD ABATEMENT: Include Homeowner or Building Owner Affidavit as per N.J.A.C. 5:17.



Date Issued 6/6/2011
Control #
Permit # 028-11

CERTIFICATE

IDENTIFICATION

Block 160 Lot 15

Work Site

200 New Rd.
Linwood, NJ 08221
Owner in Fee
Eye-Max/ Michael Canuso
Address
200 New Rd.
Linwood, NJ 08221

Telephone Contractor

Mercury Solar Systems
6390 Harding Hwy.
Mays Landing, NJ 08330

License Number: 13VH01410500
Or Social Security No.

CERTIFICATE OF OCCUPANCY

This serves notice that said building or structure has been constructed in accordance with the New Jersey Uniform Construction Code and is approved for occupancy.

☒ **CERTIFICATE OF APPROVAL**

This serves notice that the work completed has been constructed or installed in and accordance with the New Jersey Uniform Construction Code is approved. If the permit was issued for minor work, this certificate was based upon what was visible at the time of inspection

TEMPORARY CERTIFICATE OF APPROVAL

If this is a "Temporary" Certificate of Occupancy or Compliance the following conditions must be met no later than

or the owner will be subject to fine or order to vacate the property.

CERTIFICATE OF CONTINUED OCCUPANCY

This serves notice that based on a general inspection of the visible parts of the building there are no imminent hazards and the building is approved for continued occupancy.

CERTIFICATE OF COMPLIANCE

This serves notice that said potentially hazardous equipment has been installed and/or maintained in accordance with the New Jersey Uniform Construction Code and is approved for use until

Description of Work / Use :

Solar Panels

Type of Warranty Plan:

Use Group

Maximum Live Load

Construction Classification

Maximum Occupancy Load

B

999

Fee: \$ 0
Paid () Check No.:
Collected by:

Original - Applicant Copy - Office

Copy - Tax Assessor

Construction Official

U.C.C. Form F-260B



CONSTRUCTION PERMIT

Date Issued: 2-15-11

Permit # 028-11

IDENTIFICATION Block 160 Lot 15 Qualification Code _____
 Work Site Location 200 NEW RD Contractor MERCURY SOLAR
 Address 6396 HARDING HWY MKS WD 07330
 Owner in Fee MICHAEL CARUSO EYE MAX Tel. () 625 0074
 Address _____ Lic. No. or Bldrs. Reg. No. 13VH01410500
 Tel. () 231 6450

Is hereby granted permission to perform the following work:

- ☒ BUILDING ☐ PLUMBING ☐ LEAD HAZARD ABATEMENT
☒ ELECTRICAL ☐ FIRE PROTECTION ☐ DEMOLITION
☐ ELEVATOR DEVICES ☐ ASBESTOS ABATEMENT ☐ OTHER _____
 (Subchapter 8 only)

DESCRIPTION OF WORK:

SOLAR

NOTE: If construction does not commence within one (1) year of date of issuance, or if construction ceases for a period of six (6) months, this permit is void.

Estimated Cost of Work \$ 41514

Construction Official

Date

2/15/11

PAYMENTS (Office Use Only)	
Building	<u>116</u>
Electrical	<u>732</u>
Plumbing	
Fire Protection	
Elevator Devices	
Other	
DCA State Permit Fee	<u>71</u>
Cert. of Occupancy	
Other	
Total	<u>419</u>
Check No.	<u>5978</u>
Cash	
Collected by	<u>(9)</u>

(see reverse side)

UCC/170 (REV. 01/04)
 Professional Printing
 (856) 468-7933

1 WHITE-INSPECTOR

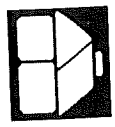
2 CANARY-OFFICE

3 PINK-TAX ASSESSOR

4 GOLD-APPLICANT



BUILDING SUBCODE TECHNICAL SECTION



A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000

Block 100 Lot 15 Qualification Code _____
 Work Site Location 200 New Road

Owner in Fee: Phenex East, Michael Caruso
 Tel. (609) 231-4450 e-mail _____
 Address 200 New Road Hampton, NJ 08221 zip code _____
 municipality _____

Contractor: Mercury Solar Systems
 Address 6390 Harding Highway, Mays Landing, NJ 08330
 Tel. (609) 625-0074 zip code _____
 email mhambleton@mercurysolarsystems.com

Contractor License No. or Builder Registration No. 13VH05183500 Exp. Date _____
 Home Improvement Contractor Registration No. or Exemption Reason (if applicable): _____
 Federal Emp. ID No. 26-2959569 FAX: (609) 837-2487

JOB SUMMARY (Office Use Only)		INSPECTIONS		Dates (Month/Day)	
PLAN REVIEW	Date	Type:	Failure	Approval	Initial
☐ No Plans Required		Footings			
☐ All		Footings/Bonding			
☐ Footings/Foundations		Foundation			
☐ Structural/Framework		Slab			
☒ Exterior <u>panels</u>		Frame			
☐ Interior		Truss Sys./Bracing			
Joint Plan Review Required:		Barrier-Free			
☐ Elec. ☐ Plumb. ☐ Fire ☐ Elevator		Insulation			
SUBCODE APPROVAL FOR PERMIT		Finishes-Base Layer			
Date:		Finishes-Final			
Approved by:		Energy			
SUBCODE APPROVAL FOR CERTIFICATE		Mechanical			
☐ CO ☐ CCO		TCO			
Date:		Other			
Approved by:		Final			
		Barrier-Free			

B. BUILDING CHARACTERISTICS

Use Group Present COM Proposed COM

No. of Stories _____ ft.

Height of Structure _____ sq. ft.

Area — Largest Floor _____ sq. ft.

New Bldg. Area/All Floors _____ cu. ft.

Volume of New Structure _____

Max. Live Load _____

Max. Occupancy Load _____

Constr. Class Present COM **Proposed** COM

If Industrialized Building: _____

State Approved _____ HUD _____

Est. Cost of Bldg. Work:

1. New Bldg. \$ 4,600.00

2. Rehabilitation \$ 4,600.00

3. Total (1+2) \$ 4,600.00

U.C.C. F110 (rev. 11/09)

RECEIVED

JAN 21 2011

Date Received _____ Control # _____

Date Issued _____ Permit # _____

2-15-11

028-11

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the duly authorized officer of record and am authorized to make this application.

Sign here: Melissa Hambleton

Print name here: Melissa Hambleton

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK:

Material and labor to install 42¹⁰ roof solar panels

TYPE OF WORK:

☐ New Building

☐ Addition

☐ Rehabilitation

☐ Roofing

☐ Siding

☐ Fence _____ Height (exceeds 6')

☐ Sign _____ Sq. Ft.

☐ Pool

☐ Retaining Wall _____ Sq. Ft.

☐ Asbestos Abatement Subchapter 8

☐ Lead Haz. Abatement NJAC 5:17

☐ Radon Remediation

☒ Other Solar Panels

☐ Demolition

FEE (Office Use Only)

Administrative Surcharge \$ _____

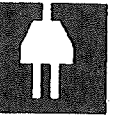
Minimum Fee \$ _____

State Permit Surcharge Fee \$ _____

TOTAL FEE \$ 114



ELECTRICAL SUBCODE TECHNICAL SECTION



A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000

Block 110 Lot 15

Qualification Code

Work Site Location

300 New Road

110000 08221

Owner in Fee:

Evermay, Basil / Michael Caruso

Tel. (609) 231-0450

e-mail

Address 300 New Road

110000 08221

City Atlantic City State NJ Zip Code 08221

Contractor: Marc Terilli

Address 36 Midland Avenue, Port Chester, NY 10573

Tel. (609) 625-0074 e-mail

Contractor License No. 16685

Exp. Date 3/31/2012

Home Improvement Contractor Registration No. or Exemption Reason (if applicable):

Federal Emp. ID No. 34EB01668500 FAX: (609) 837-2487

B. ELECTRICAL CHARACTERISTICS

Use Group Present COM

Proposed COM

[] Pole/Pad #

[] Temporary [] Other

Building Occupied as COM

Utility Co. Atlantic City Electric

Est. Cost of Elec. Work \$ 34000.00

JOB SUMMARY (Office Use Only)

PLAN REVIEW

[] No Plans Required

[] Partial - Under/Over Utilities Approved

Date: 2-8-11 Approved by: MD

Joint Plan Review Required:

[] Bldg. [] Pub. [] Fire [] Elev.

SUBCODE APPROVAL FOR PERMIT

Date: 2-8-11

Approved by: MD

SUBCODE APPROVAL FOR CERTIFICATE

[] CO [] CCO [] CCA

Date: 5-31-11

Approved by: MD

Barrier-Fee

Temp. Cut-In-Card Date Issued

Final Cut-In-Card Date Issued

Annual Pool Inspection

Date of Grounding and Bonding

Certification

Final

Service

Other

TCO

Constr. Serv.

Temp. Serv.

Trench

Barrier-Fee

Rough

Failure

Failure

Approval

Initial

Dates (Month/Day)

Final

Service

Other

TCO

Constr. Serv.

Temp. Serv.

Trench

Barrier-Fee

Rough

Failure

Failure

Approval

Initial

Dates (Month/Day)

Final

Service

Other

TCO

Constr. Serv.

Temp. Serv.

Trench

Barrier-Fee

Rough

Failure

Failure

Approval

Initial

Dates (Month/Day)

Final

Service

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Temp. Serv.

Trench

Barrier-Fee

Rough

Failure

Failure

Approval

Initial

Dates (Month/Day)

Final

Service

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TCO

Constr. Serv.

Temp. Serv.

Trench

Barrier-Fee

Rough

Failure

Failure

Approval

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Dates (Month/Day)

Final

Service

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TCO

Constr. Serv.

Temp. Serv.

Trench

Barrier-Fee

Rough

Failure

Failure

Approval

Initial

Dates (Month/Day)

Final

Service

Other

TCO

Constr. Serv.

Temp. Serv.

Trench

Barrier-Fee

Rough

Failure

Failure

Approval

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Dates (Month/Day)

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Service

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TCO

Constr. Serv.

Temp. Serv.

Trench

Barrier-Fee

Rough

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Approval

Initial

Dates (Month/Day)

Final

Service

Other

TCO

Constr. Serv.</

Linwood Zoning Requirements

For Use with Applications for New Homes, Additions, Decks, Swimming Pools and any other applicable applications.

Block: 160 Lot: 15 Zone: _____

				Existing To be completed by applicant	Proposed For Office Use Only	Variance Required Yes or No
	R-10 Zone	R-15 Zone	R-120 Zone			
Lot Size	10,000 s.f.	15,000 s.f.	20,000 s.f.	13,429.12		
Lot Width	100 feet	100 feet	100 feet	123.90		
Lot Depth	100 feet	100 feet	125 feet	114.12		
Road Frontage	100 feet	100 feet	100 feet*	234.2		
Building Coverage	Residence 30%	Residence Only 25%	Residence Only 25%	12%		
	Total Coverage 40%	Total Coverage 35%	Total Coverage 35%			
Setbacks						
Front	20 feet	25 feet	35 feet	65		
Rear	20 feet	20*feet	20* feet	29.9		
Right Side	10 feet	25 feet	25 feet	26.9		
Left Side	10 feet	25 feet	25 feet			
Building Height						
Between 0' & 20' from property line	25 feet maximum	25 feet maximum	25 feet maximum			
Beyond 20' from property line	35 feet maximum 2 stories	35 feet maximum 2 ½ stories	35 feet maximum 2 ½ stories	25		
Parking	2 Bedrooms = 1.5 spaces 3 Bedrooms = 2.0 spaces 4 Bedrooms = 2.5**spaces 5 Bedrooms = 3.0 spaces					

*Rear Setback 20 feet or 20% of lot depth, whichever is greater

** Parking – if the number of bedrooms is not specified, 2.5 spaces will be required.

Site information is taken from a survey prepared by: William P Sweeney

dated: 5.22.06

City of Linwood

FAX COVER SHEET

TO: MERCURY SOLAR

FROM: CONST. OFFICE

DATE: ~~1/25/11~~ 5/10/11

FAX #: 837-2487

Pages:

2

MESSAGE: CORRECTIONS FOR ~~PERMIT APPLICATION~~ FINAL INSPECTION
FOR

ZOO NEW RD

fixed
to contr. 
5/10/11

City of Linwood City
400 Poplar Avenue
Linwood, New Jersey 08221
609-926-7992

FIELD CORRECTION NOTICE

ADDRESS: 200 New Rd. PERMIT NO. 028-11

BLD: _____ PLMB: _____ ELEC: ✓ FIRE: _____

NOTICE DELIVERED TO: Same

INSPECTION FAILED FOR: _____

1) Solar sub-panel & meter socket need
Arce Flash warning Labels

2) Flex needs Bonding Bushing & Jumper
Both ends (Line side)

3) Need NEC 690.56(B) Label

4) Flex not in connector in crawl space

FINAL BLD. INSPECTION CANCELLED. PLEASE CALL
TO RESCHEDULE

Call 609-926-7992 to schedule re-inspection.

DATE: 5-10-11 INSPECTOR: MD

TRANSMISSION VERIFICATION REPORT

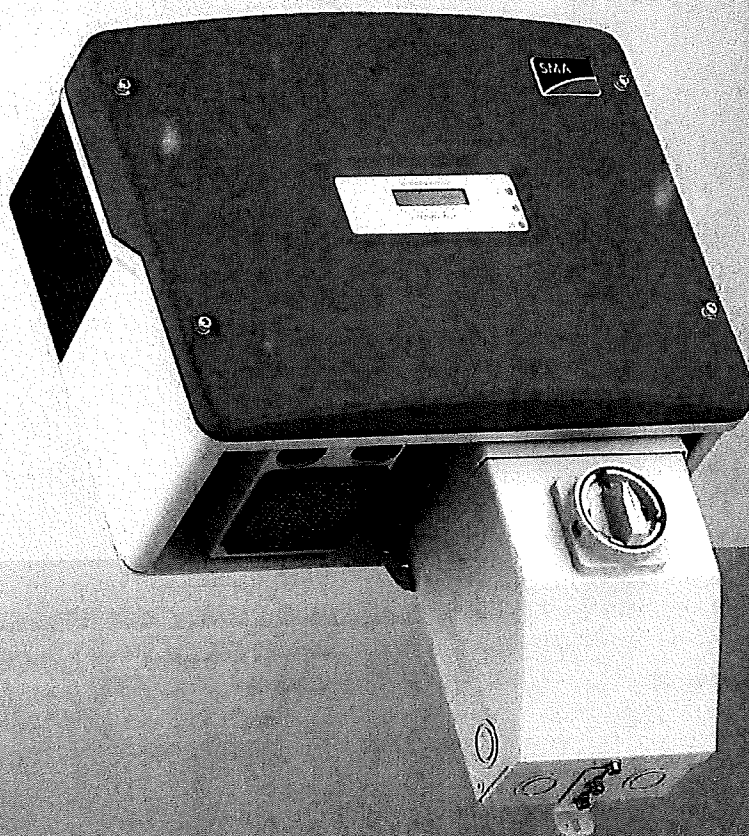
TIME : 05/10/2011 09:51
NAME :
FAX :
TEL :
SER.# : BROG9J953860

DATE, TIME
FAX NO./NAME
DURATION
PAGE(S)
RESULT
MODE

05/10 09:50
8372487
00:00:25
02
OK
STANDARD
ECM

SMA

SUNNY BOY 3000US / 4000US



- Highest CEC efficiency in its class
- Integrated load-break rated lockable DC disconnect switch
- Integrated fused series string combiner

- Sealed electronics enclosure & Opticool™
- Comprehensive SMA communications and data collection options

- Ideal for residential or light commercial applications
- Rugged cast aluminum outdoor rated enclosure
- UL 1741/IEEE-1547 compliant
- 10 year standard warranty



SUNNY BOY 3000US / 4000US

The best in their class

Our US series inverters utilize our proven technology and are designed specifically to meet IEEE-1547 requirements. Compact design makes them ideal for residential use and the integrated lockable DC disconnect makes installation more cost effective. They are field-configurable for positive ground systems making them more versatile than ever. Increased efficiency means better performance and shorter payback periods. Throughout the world, Sunny Boy is the benchmark for PV inverter performance and reliability.

STP185S - 24/Adh+
STP180S - 24/Adh+

SUNTECH
 Solar powering a green future™

185 Watt MONOCRYSTALLINE SOLAR MODULE

Suntech Black Label™ modules are exclusively designed and engineered for homeowners who seek a rooftop solar solution that combines visual aesthetics with excellent efficiency.

Features



High module conversion efficiency (up to 14.5%), through superior manufacturing technology



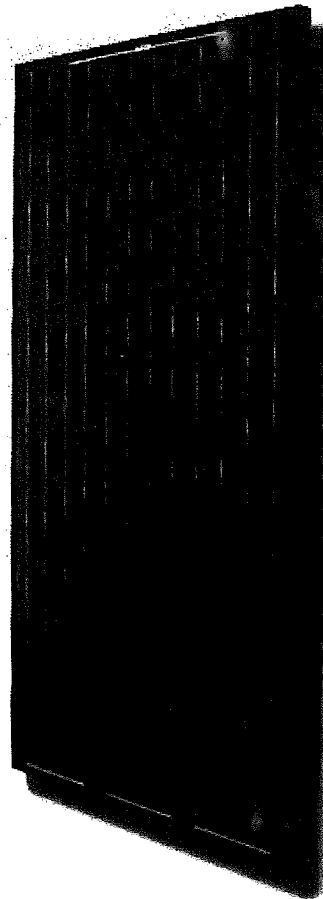
Guaranteed 0-5W positive power output tolerance ensures high reliability



Proprietary Gallium-F22 doping process dramatically reduces initial light-induced degradation to <1%, thus delivering better power and performance over time



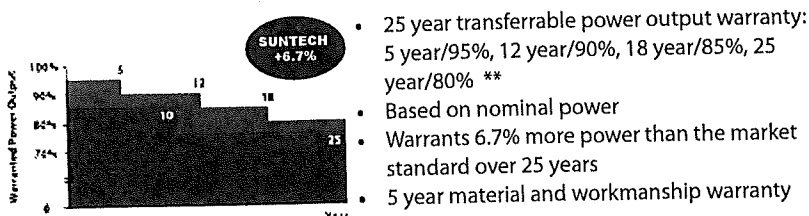
Entire module certified to withstand high wind loads (2400 Pascal) and snow loads (5400 Pascal) *



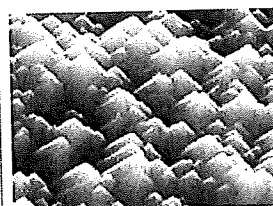
Trust Suntech to Deliver Reliable Performance Over Time

- World's leading manufacturer of crystalline silicon photovoltaic modules
- Unrivaled manufacturing capacity and world-class technology
- Rigorous quality control meeting the highest international standards: ISO 9001: 2008 and ISO 14001: 2004
- Certification and standards: IEC 61215, IEC 61730, conformity to CE

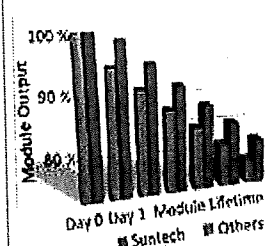
Industry-leading warranty



* Please refer to Suntech Standard Module Installation Manual for details.
 ** Please refer to Suntech Product Warranty for details.

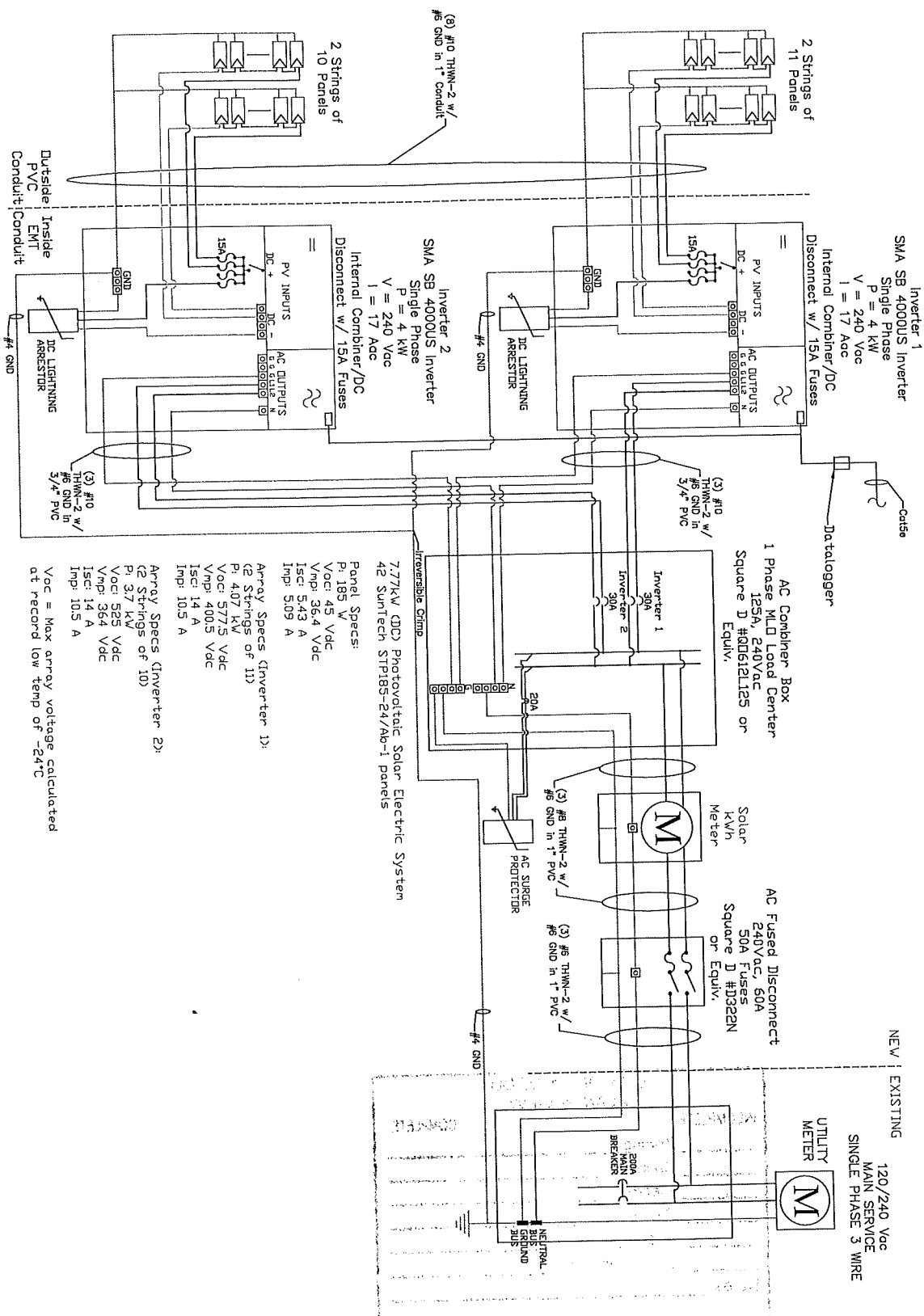


Patented surface pyramids enhance sunlight absorption by redirecting reflected light to other areas on the cell surface to be reabsorbed



Suntech cells feature a breakthrough process that replaces traditional boron doping with gallium doping. The effect of initial light-induced degradation is dramatically reduced, leading to greater power output over the entire module lifetime.

Graph is for illustration only and does not imply any guarantee of module performance. Please check warranty for details.



REVISION HISTORY

REV#	DATE	REV BY	CHANGE

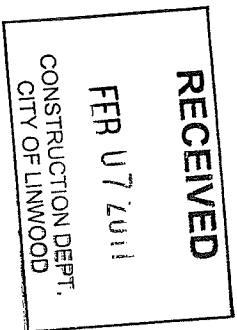
MERCURY SOLAR SYSTEM

36 Midland Ave
Port Chester, NY 10573
(P) 914-637-9700
(F) 914-637-9713



DRAWN BY: WC	DATE: 10/15/2010
CHECKED BY: LH	3-LINE DIAGRAM
SCALE: N/A	REV. # 0 REV BY:
DRAWING# 010831.C0	REV DATE: 11/17/20

Evermax Lasik
200 New Road
Littwood, NJ 08221



Mae Gwladys



February 10, 2011

City of Linwood
400 Poplar Avenue
Linwood City, NJ 08221

Re: 200 New Road
Blk.160
Lt. 15

To Whom It May Concern:

Enclosed please find our payment for our building and electric permit for the above referenced property.

If there are any further questions please don't hesitate to contact me at the numbers listed below.

Sincerely,

Ms. Melissa Hambleton
Mercury Solar Systems
5270 Oakwood Blvd
Suite 10
Mays Landing, NJ 08330
609-625-0074 ext. 2206
609-837-2487 Fax

**EXHIBIT B****SYSTEM COST BREAKDOWN and SYSTEM PAYMENT SCHEDULE**

System Cost Breakdown
 (includes all state and local tax, and shipping to installation site)

44 Suntech STP185S-24/Ab-1 (blk) solar panels	\$22,666.72
1 SMA SB-7000 US inverters	\$6,517.72
Unirac Solar Mount mounting equipment	\$4,857.15
Balance of system material	\$2,407.82
Labor, engineering, permits, overhead	\$5,064.73
Total System Cost	\$41,514.14
NJCRP Rebate Amount	\$0.00
Net Customer Cost	\$41,514.14

MERCURY SOLAR SYSTEMS

5270 Oakwood Blvd
Suite 10
Mays Landing, NJ 08330
Phone: (609) 625-0074 ext. 2206
Fax: (609) 837-2487
mhambleton@mercurysolarsystems.com

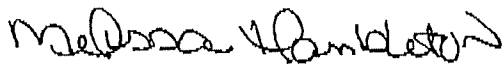
To: Construction Office	From: Melissa Hambleton
Fax: 653-2730	Pages: 2 pages including cover
Phone:	Date: 2/9/11
Re: 200 New Road	cc:

To Whom It May Concern:

As per our conversation attached is the breakdown of material cost. Be advised that do allow for fee for engineering, permits, and other cost we accrue during the process. \$7,472.55 should not be included in the remainder of the price.

If there are any questions please don't hesitate to contact me at the numbers listed below.

Sincerely,



Melissa Hambleton

facsimile

City of Linwood
400 Poplar Ave.
Linwood, New Jersey 08221-1899
(609) 926-7992 or fax: (609) 653-2730

paid
2/7/11
#5954

Zoning Permit (Review) Application
(2/20/09)

*SURVEY SHOWING LOCATION OF WORK, ELEVATIONS, SETBACKS, AND
COVERAGES MUST ACCOMPANY PERMIT APPLICATION

BLOCK: 1160 LOT: 15 ZONE: _____
Tele: # (609) 231-6450

NAME: Eyemax Lasik

ADDRESS: 200 New Road, Linwood NJ 08221

CONTRACTOR: Mercury Solar Systems Tele: # 609-625-0074

ADDRESS: 5270 Oakwood Blvd Mays Landing, NJ 08330

DESCRIPTION OF WORK: To mount a 7.77KW solar array

to roof, this will not change roof height COST OF JOB: \$39,627.14

PERMIT FEE(s):

New Home Construction:

\$250.00

Additions (incl. decks & swimming pools): \$100.00

Accessory Structures:

\$ 50.00

Cash or Check in the applicable amount (made payable to the City of Linwood) is due upon
submission of said application.

Zoning Officer's Comments: _____

ZONING REV.: _____

Signature (Zoning Officer)

Date: 2/7/11

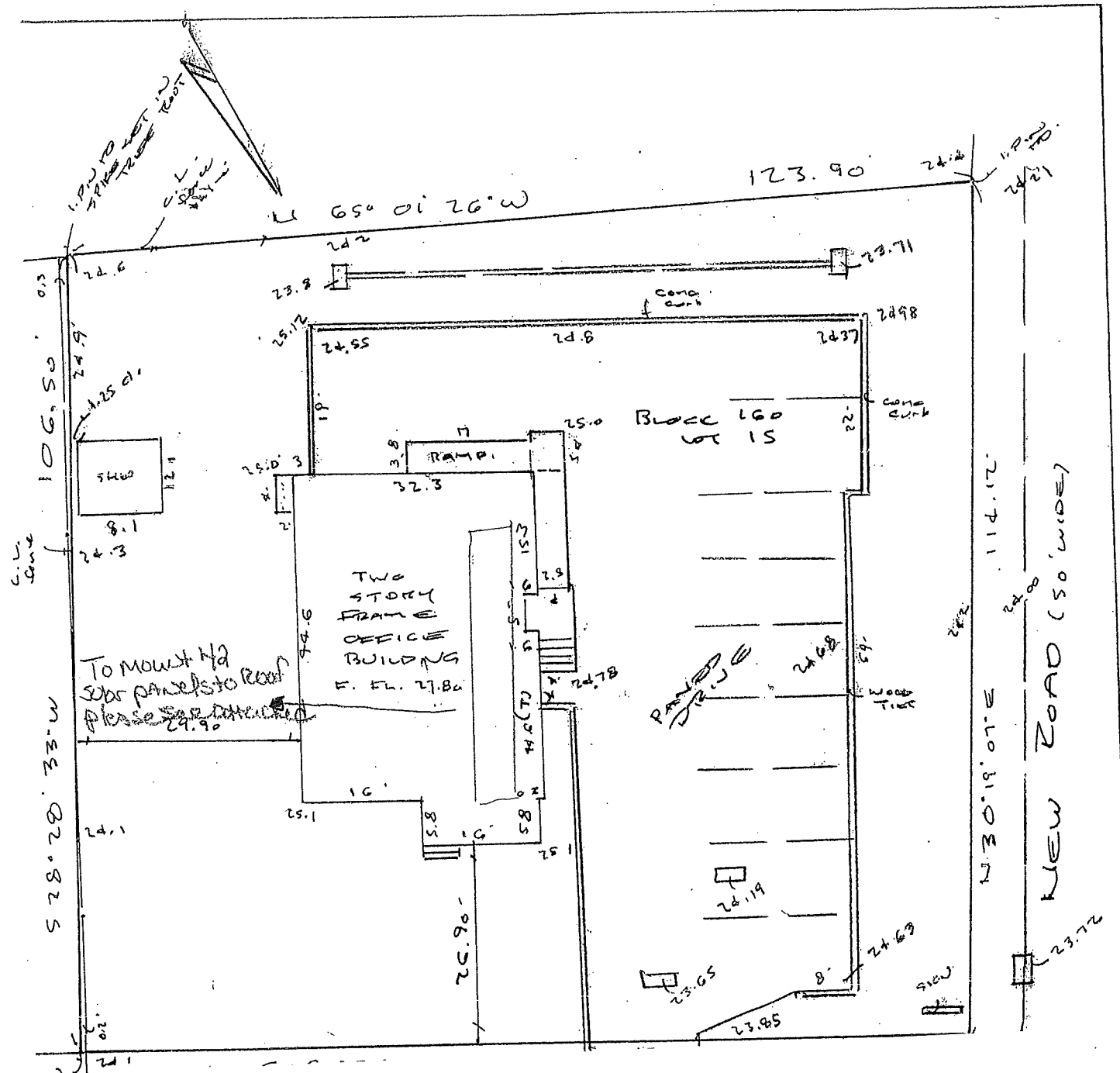
Approved Denied
(circle one)

ZONING REV.: _____

Signature (Zoning Officer)

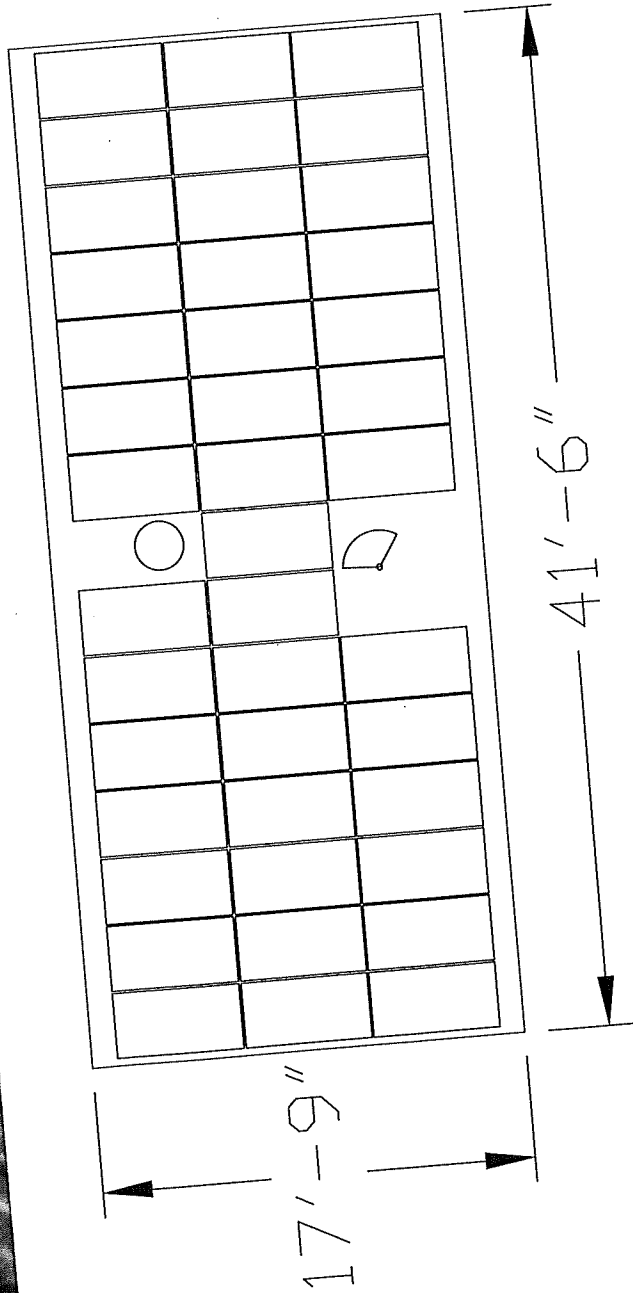
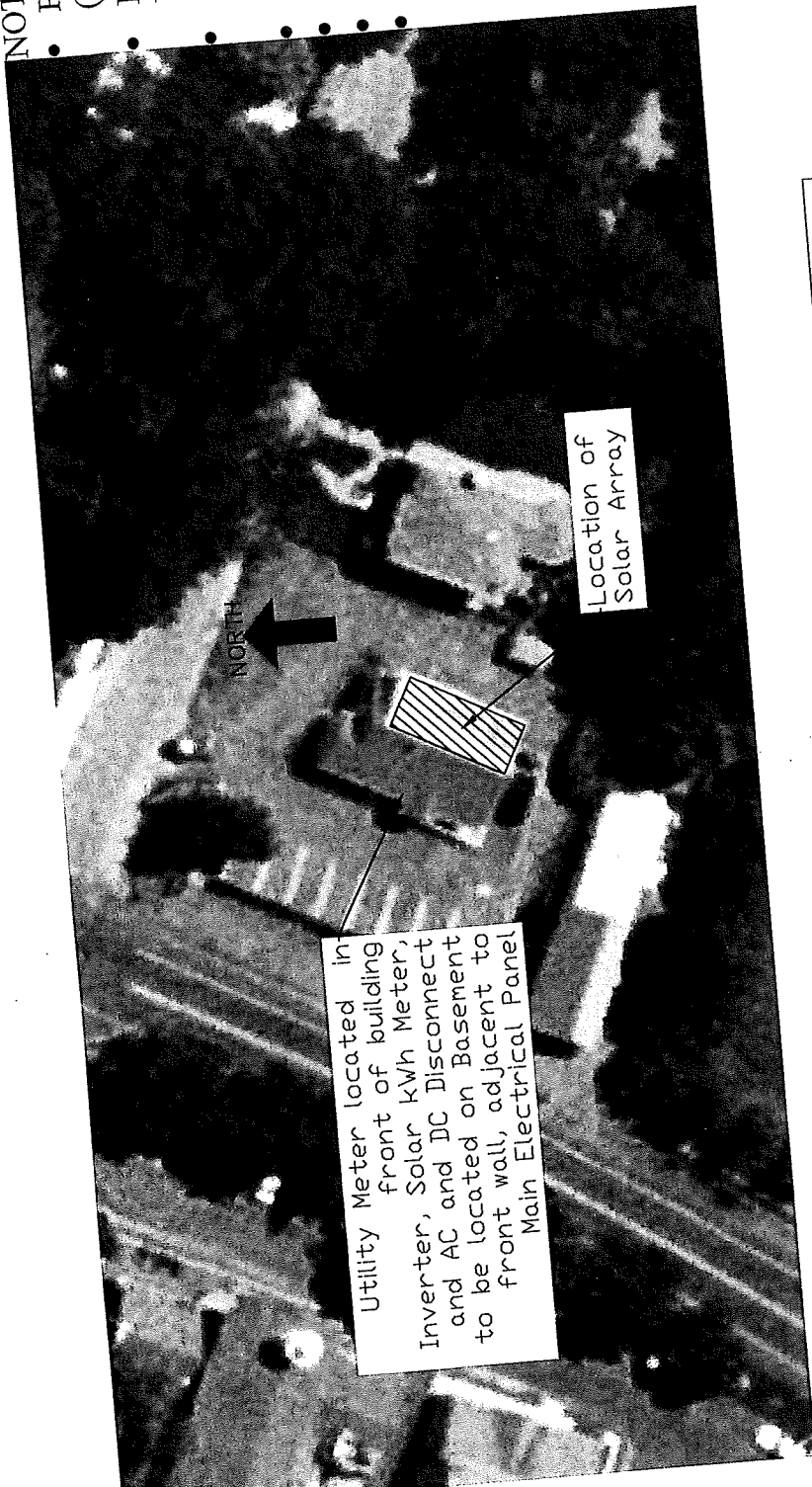
Date: _____

Approved Denied
(circle one)



NOTES:

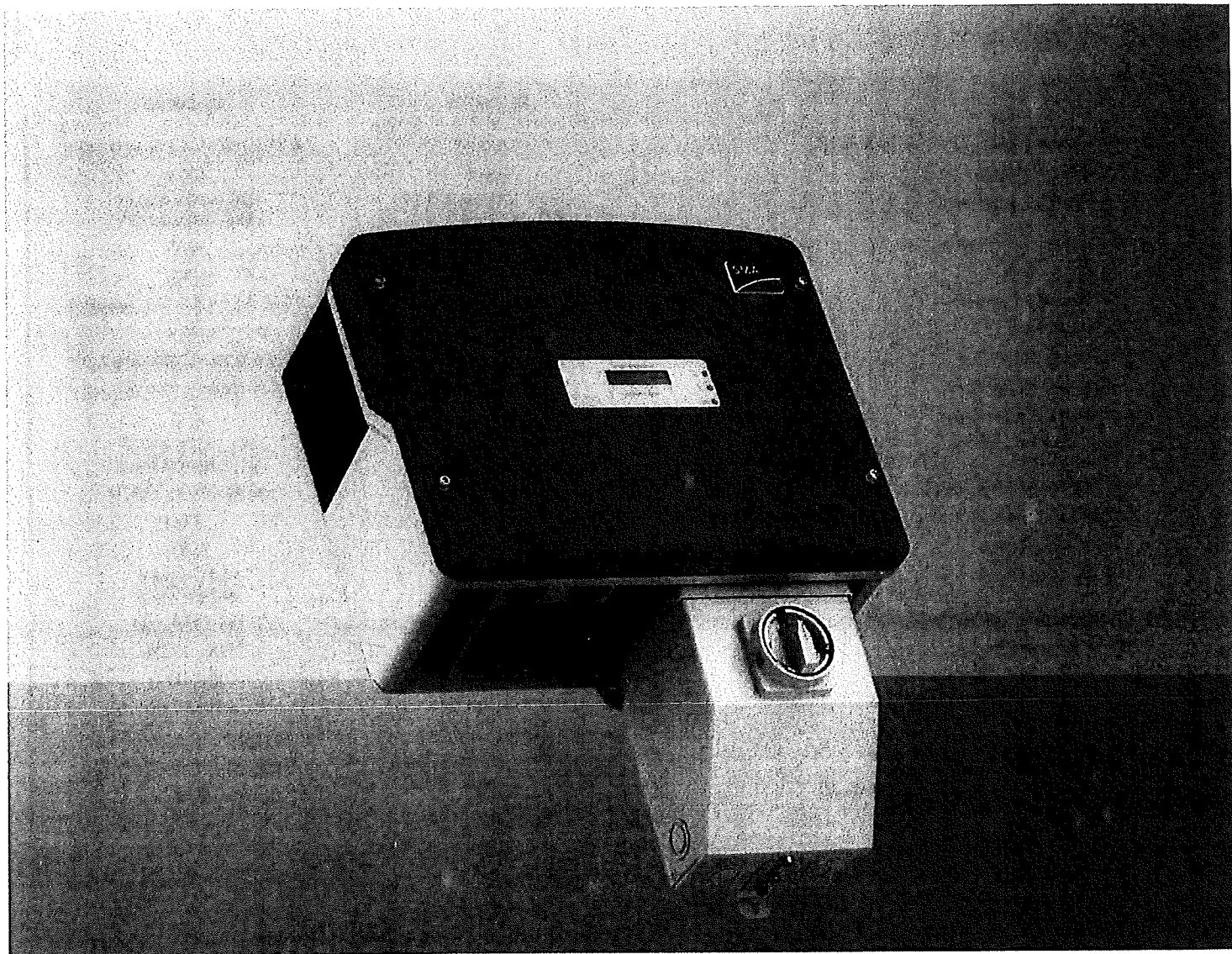
- Panel Type and Quantity:
(42) SunTech STP185-24/Ab-1
- Racking System:
UniRac SolarMount
- Recommended Inverter(s):
(2) SMA SB 4000US
- DC Power Output: 7.77 kW
- Roof Height: 2 Stories
- Roof Tilt: 9°
- Azimuth: 117°



MERCURY SOLAR SYSTEMS 36 Midland Ave Port Chester, NY 10573 (P) 914-637-9700 (F) 914-637-9713 	
CUSTOMER NAME Eyemax Lasik 200 New Road Linwood, NJ 08221	
DRAWN BY: WC	DATE: 10/15/2010
CHECKED BY: ---	LAYOUT
SCALE: N.T.S.	REV. # 2
DRAWING# 010831.A.0 REV DATE: 1/18/2011	



SUNNY BOY 3000US / 4000US



- Highest CEC efficiency in its class
- Integrated load-break rated lockable DC disconnect switch
- Integrated fused series string combiner

- Sealed electronics enclosure & OptiCool™
- Comprehensive SMA communications and data collection options

- Ideal for residential or light commercial applications
- Rugged cast aluminum outdoor rated enclosure
- UL 1741/IEEE-1547 compliant
- 10 year standard warranty



SUNNY BOY 3000US / 4000US

The best in their class

Our US series inverters utilize our proven technology and are designed specifically to meet IEEE-1547 requirements. Compact design makes them ideal for residential use and the integrated lockable DC disconnect makes installation more cost effective. They are field-configurable for positive ground systems making them more versatile than ever. Increased efficiency means better performance and shorter payback periods. Throughout the world, Sunny Boy is the benchmark for PV inverter performance and reliability.

STP185S - 24/Adb+
STP180S - 24/Adb+

SUNTECH
 Solar powering a green future™

185 Watt MONOCRYSTALLINE SOLAR MODULE

Suntech Black Label™ modules are exclusively designed and engineered for homeowners who seek a rooftop solar solution that combines visual aesthetics with excellent efficiency.

Features



High module conversion efficiency (up to 14.5%), through superior manufacturing technology



Guaranteed 0-5W positive power output tolerance ensures high reliability



Proprietary Gallium-F22 doping process dramatically reduces initial light-induced degradation to <1%, thus delivering better power and performance over time



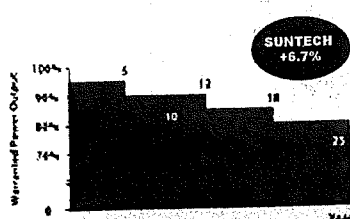
Entire module certified to withstand high wind loads (2400 Pascal) and snow loads (5400 Pascal) *



Trust Suntech to Deliver Reliable Performance Over Time

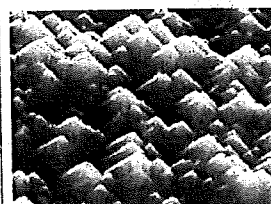
- World's leading manufacturer of crystalline silicon photovoltaic modules
- Unrivaled manufacturing capacity and world-class technology
- Rigorous quality control meeting the highest international standards: ISO 9001: 2008 and ISO 14001: 2004
- Certification and standards: IEC 61215, IEC 61730, conformity to CE

Industry-leading warranty

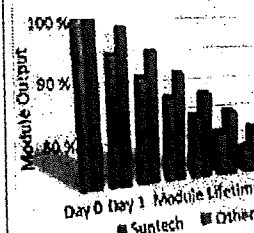


- 25 year transferrable power output warranty: 5 year/95%, 12 year/90%, 18 year/85%, 25 year/80% **
- Based on nominal power
- Warrants 6.7% more power than the market standard over 25 years
- 5 year material and workmanship warranty

* Please refer to Suntech Standard Module Installation Manual for details.
 ** Please refer to Suntech Product Warranty for details.



Patented surface pyramids enhance sunlight absorption by redirecting reflected light to other areas on the cell surface to be reabsorbed

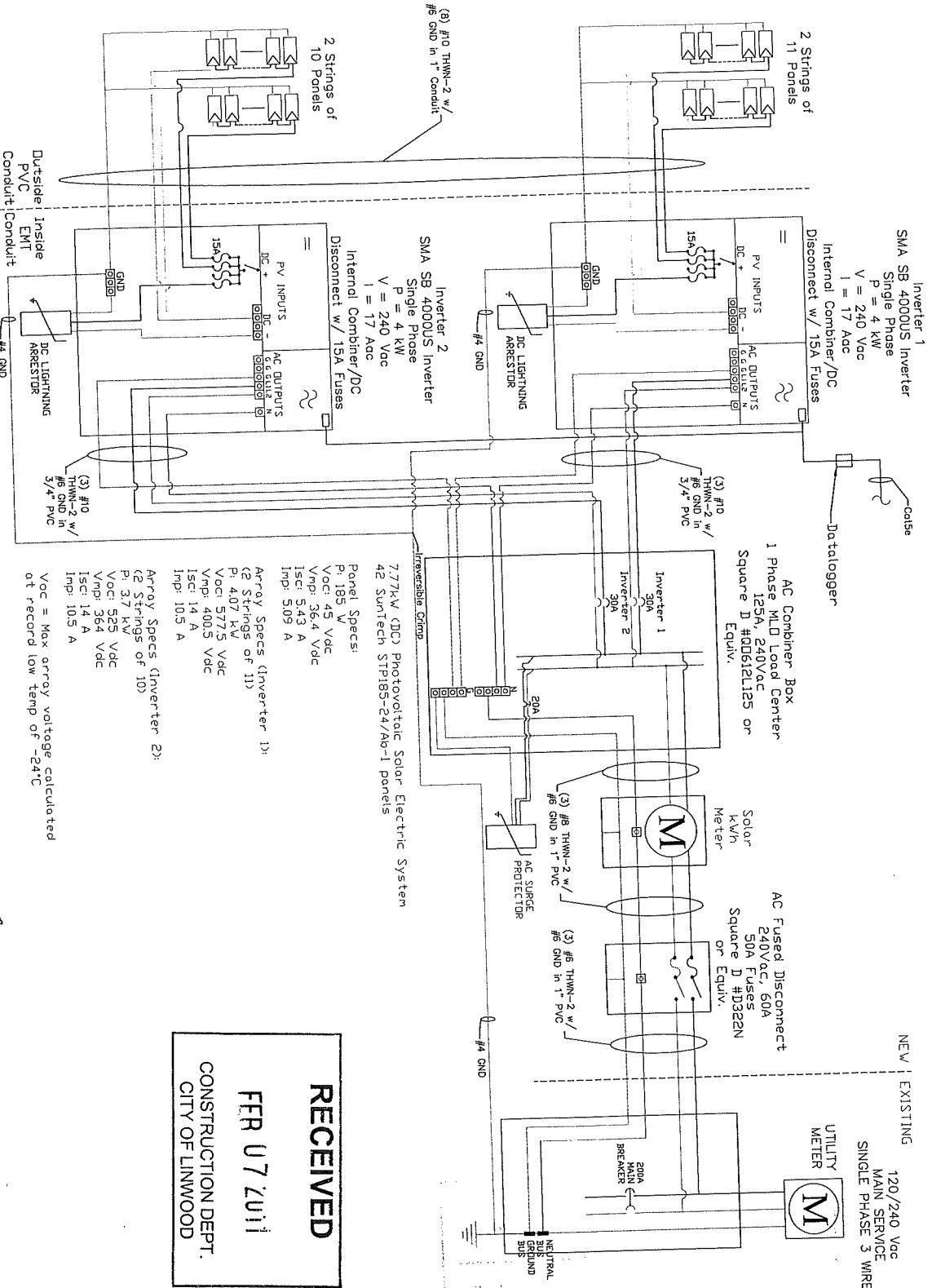


Suntech cells feature a breakthrough process that replaces traditional boron doping with gallium doping. The effect of initial light-induced degradation is dramatically reduced, leading to greater power output over the entire module lifetime.

Graph is for illustration only and does not imply any guarantee of module performance. Please check warranty for details.



DRAWN BY: WC	DATE: 10/15/2010
CHECKED BY: LH	3-LINE DIAGRAM
SCALE: N/A	REV. # 0 REV BY: --
DRAWING# 010831.C0 REV DATE: 11/17/2010	



Voc = Max array voltage calculated at record low temp of -24°C

RECEIVED
FFR U7 2011
CONSTRUCTION DEPT.
CITY OF LINWOOD

Handwritten signature

REVISION HISTORY			
REV#	DATE	REV BY	CHANGE

MERCURY SOLAR SYSTEMS 36 Midland Ave Port Chester, NY 10573 (P) 914-637-9700 (F) 914-637-9713		CUSTOMER NAME Byemex Lasik 200 New Road Linwood, NJ 08221
DRAWN BY: W/C CHECKED BY: LH SCALE: N/A	DATE: 10/15/2010 3-LINE DIAGRAM REV: 0 REV DATE: 11/17/2010	DRAWING# 010831C0



RECEIVED

FEB 07 2011

CONSTRUCTION DEPT.
CITY OF LINWOOD

January 28, 2011

City of Linwood
400 Poplar Avenue
Linwood, NJ 08221

Re: 500 New Road
Blk. 160
Lt. 15

To Whom It May Concern:

Enclosed please find our correction for building and electrical application for the above referenced property.

If there are any further questions please don't hesitate to contact me at the numbers listed below.

Sincerely,

Ms. Melissa Hambleton
Mercury Solar Systems
5270 Oakwood Blvd
Suite 10
Mays Landing, NJ 08330
609-625-0074 ext. 2206
609-837-2487 Fax

axed
to conty.
1/25/11



City of Linwood

Construction Department

Plan Review Correction List

Date: 1-26-11 Reviewed by: Mike Dempsey

Building Location (Address): 200 New Rd.

Building Description: _____

Use Group: _____

Constr. Type: _____

No.	Description of Correction	Code Section
1	Both sets of Electrical Plans, must be sealed by Electrical contractor	NJAC 5:23-2.15 (F) vii (2)
2		

Submit your corrections to the Linwood Construction Office, Linwood City Hall, 400 Poplar Avenue, Linwood, New Jersey 08221.

*To contact the Sub Code Official, call 609-926-7992.

TRANSMISSION VERIFICATION REPORT

TIME : 01/25/2011 10:49
NAME :
FAX :
TEL :
SER.# : BROG9J953860

DATE, TIME	01/25 10:49
FAX NO./NAME	8372487
DURATION	00:00:25
PAGE(S)	02
RESULT	OK
MODE	STANDARD
	ECM

ROOF LOAD ANALYSIS

FOR

**INSTALLATION OF
SOLAR PANEL ARRAY
ON THE ROOF OF
EYEMAX LASIK
200 NEW ROAD
LINWOOD, NJ 08221**

PREPARED FOR:

**MERCURY SOLAR SYSTEMS, INC.
MAYS LANDING, NJ**

PREPARED BY:

CENTURION CONSTRUCTION SERVICES, LLC

6396 Beacon Ave., Mays Landing, NJ 08330

Phone: (609) 625 - 6640 - Fax: (609) 625-1930 - Cell: (609) 743-7160

www.centurionconstructionservices.com

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JANUARY 17, 2011



Douglas G. Penoyer, PE
NJ Cert. GE 39512

INDEX

1. Purpose

2. Narrative

3. Calculations

- i) Determination of Roof Loads Pursuant to ASCE 7-05
- ii) RISA Structural Analysis Software Calculation Package

4. Attachments

1. PURPOSE

The intent of these calculations is to determine if the installation of the given Solar Panel array on the roof of Eyemax Lasik, when combined with a load from snow accumulation and wind, exceeds the load-carrying ability of the existing roof.

NARRATIVE

INTRODUCTION:

Mercury Solar Systems has been awarded a contract to install a Solar Panel Array on the Roof of Eyemax Lasik located in Linwood, NJ. Mercury Solar Systems has approached the engineer to determine if the installation of this system will exceed the load carrying ability of the roof of the building. This analysis concerns the ability of the existing roof to support the solar array.

ANALYSIS:

The engineer was provided the following resources to perform his analysis and design:

- A description of the solar array layout and existing structural conditions, transmitted electronically by Mercury Solar Systems 12-30-10.
- A physical site inspection conducted by the engineer 1-10-11

All noted information above is attached hereto either physically or by reference.

The roof was inspected by Mercury Solar representatives and was found to be in good to very good condition.

To determine if the Snow Load plus Panel Dead Load exceeded the roof's design load, the engineer referred to the ASCE Standard ASCE/SEI 7-05 "Minimum Design Loads for Buildings and Other Structures". The snow load was determined pursuant to Chapter 7 in the referenced standard. The dead load for the solar panels was taken from the referenced product data. The existing roof was analyzed using these values.

As can be seen from the attached calculations, the solar panel load when combined with the snow load and vertical wind load does not exceed the load carrying ability of the roof in either section.

RECOMMENDATIONS:

General:

- Contractor is required to comply with all nationally accepted safety practices, OSHA, and any other safety requirements imposed by the owner, owner's representative, agency, or any other parties that may have jurisdiction over safety. These items may exceed the structural requirements, which are shown on the attached calculations, the contract drawings, or other contract documents. In addition, the contractor shall be solely responsible for construction means, methods, techniques, sequence of construction, etc., to ensure the safety of his or her employees and the general public at all times.

- Refer to contract documents for additional information concerning construction operations not contained on this document.
- This document does not specifically address any requirements stipulated by OSHA. The contractor is to be made aware of the fact that any and all requirements as set forth by OSHA Part 1926 shall be complied with and are his sole responsibility.
- This document has been prepared based on contract documents and other information available at the time of design. Actual field conditions may require modifications to construction details. The contractor shall perform the work pursuant to field conditions.
- The engineer has made an effort to select conditions that in his opinion represent the "worst-case scenarios" regarding loading and analysis for this project. *These analyses are not intended to be totally comprehensive or inclusive. It is the contractor's responsibility to approach the engineer for guidance in questionable areas.*

Specific:

- *This analysis concerns only the ability of the existing roof to support the given solar array. This analysis does not include a structural analysis of the actual system to be installed, nor does it include an analysis of the existing structure below the roof support system. It is assumed that if the array does not exceed the original design loading, the system will not overstress the balance of the structure.*

CALCULATIONS

Determination of Roof Loads Pursuant to ASCE 7-05

Centurion Construction Services, LLC

6396 Beacon Ave., Mays Landing, NJ 08330

Phone: 609-625-6640 Fax: 609-625-1930

doug@centurionconstructionservices.com

Job: C11-14 - Eyemax Lasik Solar Installation

Sheet / of 3

Calc by DGP Date 1/17/11

Scale: None

-
- Determine that Sunlink PV Module Roof Solar Energy System plus snow load will not exceed roof design load:
-

- Determine Snow Load for Roof:

- Determine Snow Load Pursuant to ASCE/SEI 7-05, "Minimum Design Loads for Buildings and Other Structures"

From Section 7.4, Sloped Roof Snow Loads:

$$p_s = (C_s) (p_f)$$

where:

 p_s = Snow Load on Sloped Roof C_s = Roof Slope FactorPer 7.4.1, using 7.2a, 8.5° Sloped Roof, $C_s = 1.0$

From Section 7.3, Flat Roof Snow Loads,

$$p_f = (0.7) (C_e) (C_t) (I) (p_g)$$

where:

 p_f = Snow Load on Flat Roof C_e = Exposure Factor:

From Table 7-2, Figure Terrain Category "B" (As determined from section 6.5.6.2)

Fully Exposed = 0.9

Partially Exposed = 1.0 <==== (Worst Case Scenario)

 C_t = Thermal Factor:From Table 7-3, $C_t = 1.0$ I = Importance Factor

From Table 1-1, Figure Building is Category III

From Table 7-4, $I = 1.1$ p_g = Ground Snow Load

From Figure 7-1, Figure 20 PSF

$$p_f = (0.7) (C_e) (C_t) (I) (p_g) = (0.7) (1.0) (1.0) (1.1) (20 \text{ PSF})$$

$$p_f = 15.4 \text{ PSF}$$

$$\text{Minimum } p_f \text{ (per 7.3.4)} = (I) (p_g) = (1.1) (20 \text{ PSF}) = 22 \text{ PSF}$$

$$p_s = (C_s) (p_f) = (1.0) (22 \text{ PSF}) = \underline{22.0 \text{ PSF}}$$

Centurion Construction Services, LLC

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Phone: 609-625-6640 Fax: 609-625-1930

doug@centurionconstructionservices.com

Job: C11-14 - Eyemax Lasik Solar Installation

Sheet 2 of 3

Calc by DGP Date 1/17/11

Scale: None

- Determine Total Load of Solar Panels on Roof:**- Dead Load from Panels:**

- From Attached Sunlink PV Module Mounting System Data, Maximum Unballasted Dead Load = 2.7 PSF Maximum

- Determine Wind Load for Roof:

- Determine Wind Load Pursuant to ASCE/SEI 7-05, "Minimum Design Loads for Buildings and Other Structures"

From Section 6.4, Method 1 - Simplified Procedure

Review of Conditions Specified in 6.4.1.1 and 6.4.1.2 ==> Building meets conditionsBasic Wind Speed Pursuant to 6.5.4 - From Figure 6-1, 110 MPH

Importance Factor Pursuant to 6.5.5:

From Table 1-1, Figure Building is Category III

From Table 6-1, $I = 1.15$

Exposure Category Pursuant to 6.5.6:

Figure Terrain Category "B" (As determined from section 6.5.6.2)

Height and Exposure Coefficient, λ , Pursuant to Figure 6-2: $\lambda = 1.0$ p_{s30} = From Figure 6-2 = 23.1 PSF (Max. of Zones B, D, E, F, G, and H),

but Not less than 10 PSF Pursuant to 6.4.2.2.1

 K_{zt} , Pursuant to 6.5.7.2 = 1.0Wind Pressure, p_s , Pursuant to 6.4.2.1:

$$p_s = \lambda K_{zt} I p_{s30} = (1.0)(1.0)(1.15)(23.1) = \underline{26.6 \text{ PSF}} = \text{Maximum Wind Load}$$

- Determine Total Snow Load, Wind Load, and Panel Dead Load:

$$22.0 \text{ PSF Snow} + 2.7 \text{ PSF Panel Dead} + 26.6 \text{ PSF Wind} = \underline{51.3 \text{ PSF}}$$

==> Allow 51.3 PSF

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Phone: 609-625-6640 Fax: 609-625-1930

doug@centurionconstructionservices.com

Job: C11-14 --Eyemax Lasik Solar Installation

Sheet 3 of 3

Calc by DGP Date 1/17/11

Scale: None

- Determine Roof Design Loads:- Check Rafter Supported Section for Array #2

- Use As-built information from site Visit 1-10-11
- Use AITC Specifications and ASCE 7-05 for analysis of the existing roof system
- From inspection, Roof consists of:

Asphaltic Roofing Shingles ==>	Allow	3.0 PSF
0.5" plywood sheathing (@ ~45 PCF) ==>	Allow	1.9 PSF
Total Dead Weight of Roof Supported by Rafters		<u>4.9 PSF</u>

Add Live weight from above	51.3 PSF
Total Weight to be supported =	<u>56.2 PSF</u>

For Rafter, Load / LF:

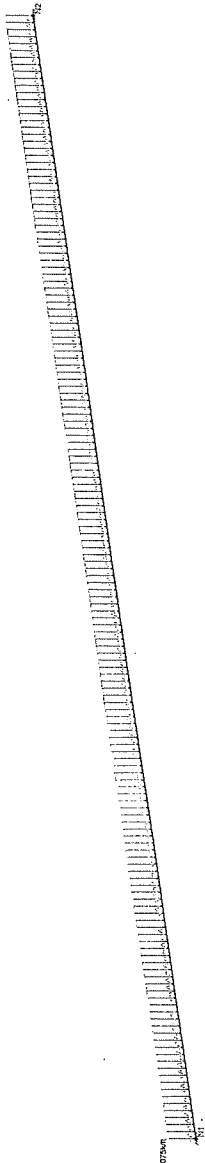
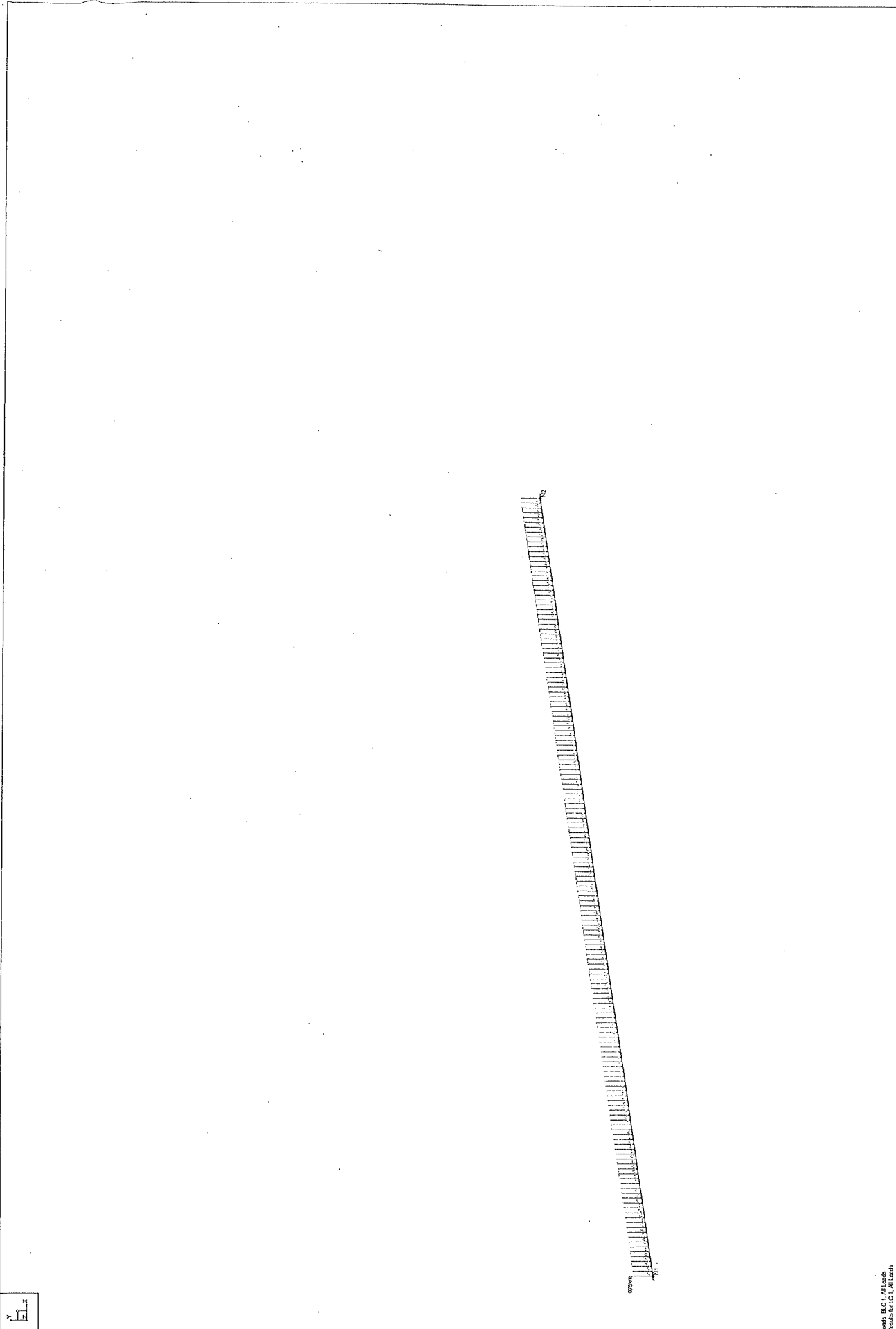
Solar Panel Loaded Sides = 56.2 PSF x 1.33' C-C Spacing = 74.75 PLF

See attached RISA Structural Analysis Software Printout.

From Printouts, we see that Rafter Supported Section is OK for Load

CALCULATIONS

RISA Structural Analysis Software Calculation Package



SK - 1	
Jan 17, 2011 at 8:44 PM	
untitled.r3d	

Company :
 Designer :
 Job Number :

Jan 17, 2011
 8:46 PM
 Checked By: _____

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area (Me...	Surface (...)
1	All Loads	None		-1				1		

Wood Design Parameters

	Label	Shape	Length[ft]	le2[ft]	le1[ft]	le-bend to...	le-bend bo...	Kyy	Kzz	CV	Cr	y sway	z sway
1	M1	2X8	15.674	0	0	0	0	1	1				

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	N1	0	.608	0	0	0	1.572
2	1	N2	0	.608	0	0	0	-1.572
3	1	Totals:	0	1.217	0			
4	1	COG (ft):	X: 7.75	Y: 1.165	Z: 0			

Load Combination Design

	Description	ASIF	CD	ABIF	Service	Hot Rolled	Cold Form...	Wood	Concrete	Masonry	Footings	Aluminum
1	All Loads					Yes	Yes	Yes	Yes	Yes	Yes	Yes

Member Distributed Loads (BLC 1 : All Loads)

	Member Label	Direction	Start Magnitude[k/ft,d...	End Magnitude[k/ft,d...	Start Location[ft.%]	End Location[ft.%]
1	M1	Y	-.075	-.075	0	0

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N2			2X8	Beam	Rectangular	HF	Typical

Warning Log

Message
 No Data to Print ...

Member Wood Code Checks

	LC	Member	Shape	UC Max	Loc[ft]	Shear ...	Loc[ft]	Dir	Fc[ksi]	Ft'[ksi]	Fb1'[ksi]	Fb2'[ksi]	Fv'[ksi]	RB	CL	CP	Eqn
1	1	M1	2X8	1.238	15.674	.553	15.674	y	1.418	.75	1.17	1.345	.15	0	1	1	3.9-1

Beam: **M1**

Shape: **2X8**

Material: **HF**

Length: **15.674 ft**

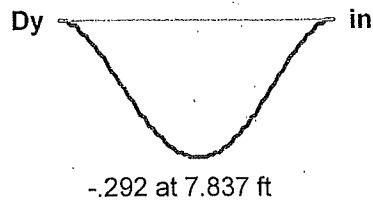
I Joint: **N1**

J Joint: **N2**

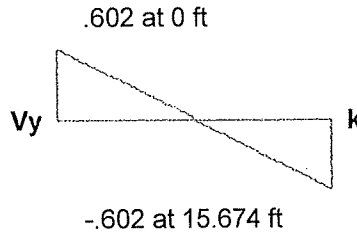
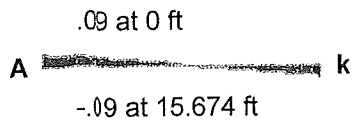
LC 1: **All Loads**

Code Check: **1.238 (bending)**

Report Based On 97 Sections

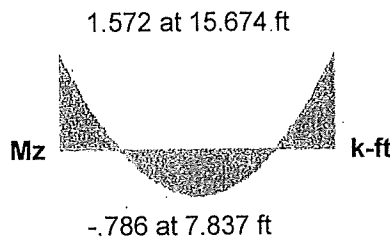


Dz _____ in

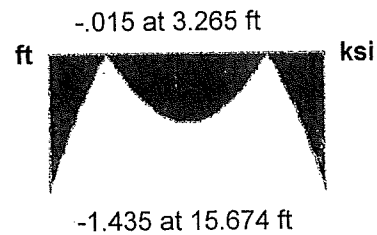
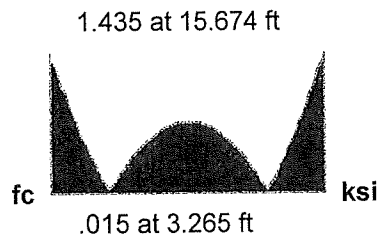
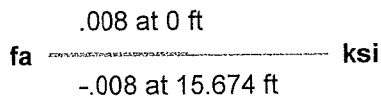


Vz _____ k

T _____ k-ft



My _____ k-ft



AF&PA NDS-05: ASD Code Check

Max Bending Check **1.238**
Location **15.674 ft**
Equation **3.9-1**

Max Shear Check **0.553 (y)**
Location **15.674 ft**
Max Defl Ratio **L/644**

CD **1** RB **0**
Cr **1** Cfu **1.15**

CL **1**
CP **1**

	(ksi)	Cm	Ct	CF
Fc'	1.418	1	1	1.05
Ft'	.75	1	1	1.2
Fb1'	1.17	1	1	1.2
Fb2'	1.345	1	1	1.2
Fv'	.15	1	1	
E'	1500	1	1	

Lb **0 ft** Y-Y **0 ft** Z-Z **0 ft**
le/d **0**
Sway **No**
Le-Bending Top **0 ft**
Le-Bending Bot **0 ft**

Attachments

- A. Chapter 6, "Wind Loads", from ASCE Standard ASCE/SEI 7-05 "Minimum Design Loads for Buildings and Other Structures"
- B. Chapter 7, "Snow Loads", from ASCE Standard ASCE/SEI 7-05 "Minimum Design Loads for Buildings and Other Structures"
- C. Solar Panel Roof Load Calculations
- D. As-built and installation data provided by Mercury Solar Systems, Inc.

ATTACHMENT A

Chapter 6 WIND LOADS

6.1 GENERAL

6.1.1 Scope. Buildings and other structures, including the Main Wind-Force Resisting System (MWFRS) and all components and cladding thereof, shall be designed and constructed to resist wind loads as specified herein.

6.1.2 Allowed Procedures. The design wind loads for buildings and other structures, including the MWFRS and component and cladding elements thereof, shall be determined using one of the following procedures: (1) Method 1—Simplified Procedure as specified in Section 6.4 for buildings meeting the requirements specified therein; (2) Method 2—Analytical Procedure as specified in Section 6.5 for buildings meeting the requirements specified therein; (3) Method 3—Wind Tunnel Procedure as specified in Section 6.6.

6.1.3 Wind Pressures Acting on Opposite Faces of Each Building Surface. In the calculation of design wind loads for the MWFRS and for components and cladding for buildings, the algebraic sum of the pressures acting on opposite faces of each building surface shall be taken into account.

6.1.4 Minimum Design Wind Loading. The design wind load, determined by any one of the procedures specified in Section 6.1.2, shall be not less than specified in this section.

6.1.4.1 Main Wind-Force Resisting System. The wind load to be used in the design of the MWFRS for an enclosed or partially enclosed building or other structure shall not be less than 10 lb/ft^2 (0.48 kN/m^2) multiplied by the area of the building or structure projected onto a vertical plane normal to the assumed wind direction. The design wind force for open buildings and other structures shall be not less than 10 lb/ft^2 (0.48 kN/m^2) multiplied by the area A_f .

6.1.4.2 Components and Cladding. The design wind pressure for components and cladding of buildings shall not be less than a net pressure of 10 lb/ft^2 (0.48 kN/m^2) acting in either direction normal to the surface.

6.2 DEFINITIONS

The following definitions apply only to the provisions of Chapter 6:

APPROVED: Acceptable to the authority having jurisdiction.

BASIC WIND SPEED, V : Three-second gust speed at 33 ft (10 m) above the ground in Exposure C (see Section 6.5.6.3) as determined in accordance with Section 6.5.4.

BUILDING, ENCLOSED: A building that does not comply with the requirements for open or partially enclosed buildings.

BUILDING ENVELOPE: Cladding, roofing, exterior walls, glazing, door assemblies, window assemblies, skylight assemblies, and other components enclosing the building.

Minimum Design Loads for Buildings and Other Structures

BUILDING AND OTHER STRUCTURE, FLEXIBLE: Slender buildings and other structures that have a fundamental natural frequency less than 1 Hz.

BUILDING, LOW-RISE: Enclosed or partially enclosed buildings that comply with the following conditions:

1. Mean roof height h less than or equal to 60 ft (18 m).
2. Mean roof height h does not exceed least horizontal dimension.

BUILDING, OPEN: A building having each wall at least 80 percent open. This condition is expressed for each wall by the equation $A_o \geq 0.8A_g$ where

A_o = total area of openings in a wall that receives positive external pressure, in ft^2 (m^2)

A_g = the gross area of that wall in which A_o is identified, in ft^2 (m^2)

BUILDING, PARTIALLY ENCLOSED: A building that complies with both of the following conditions:

1. The total area of openings in a wall that receives positive external pressure exceeds the sum of the areas of openings in the balance of the building envelope (walls and roof) by more than 10 percent.
2. The total area of openings in a wall that receives positive external pressure exceeds 4 ft^2 (0.37 m^2) or 1 percent of the area of that wall, whichever is smaller, and the percentage of openings in the balance of the building envelope does not exceed 20 percent.

These conditions are expressed by the following equations:

1. $A_o > 1.10A_{oi}$
2. $A_o > 4 \text{ sq ft}$ (0.37 m^2) or $> 0.01A_g$, whichever is smaller, and $A_{oi}/A_{gi} \leq 0.20$

where

A_o, A_g are as defined for Open Building

A_{oi} = the sum of the areas of openings in the building envelope (walls and roof) not including A_o , in ft^2 (m^2)

A_{gi} = the sum of the gross surface areas of the building envelope (walls and roof) not including A_g , in ft^2 (m^2)

BUILDING OR OTHER STRUCTURE, REGULAR-SHAPED: A building or other structure having no unusual geometrical irregularity in spatial form.

BUILDING OR OTHER STRUCTURES, RIGID: A building or other structure whose fundamental frequency is greater than or equal to 1 Hz.

BUILDING, SIMPLE DIAPHRAGM: A building in which both windward and leeward wind loads are transmitted through floor and roof diaphragms to the same vertical MWFRS (e.g., no structural separations).

COMPONENTS AND CLADDING: Elements of the building envelope that do not qualify as part of the MWFRS.

DESIGN FORCE, F : Equivalent static force to be used in the determination of wind loads for open buildings and other structures.

DESIGN PRESSURE, p : Equivalent static pressure to be used in the determination of wind loads for buildings.

EAVE HEIGHT, h : The distance from the ground surface adjacent to the building to the roof eave line at a particular wall. If the height of the eave varies along the wall, the average height shall be used.

EFFECTIVE WIND AREA, A : The area used to determine GC_p . For component and cladding elements, the effective wind area in Figs. 6-11 through 6-17 and Fig. 6-19 is the span length multiplied by an effective width that need not be less than one-third the span length. For cladding fasteners, the effective wind area shall not be greater than the area that is tributary to an individual fastener.

ESCARPMENT: Also known as scarp, with respect to topographic effects in Section 6.5.7, a cliff or steep slope generally separating two levels or gently sloping areas (see Fig. 6-4).

FREE ROOF: Roof with a configuration generally conforming to those shown in Figs. 6-18A through 6-18D (monoslope, pitched, or troughed) in an open building with no enclosing walls underneath the roof surface.

GLAZING: Glass or transparent or translucent plastic sheet used in windows, doors, skylights, or curtain walls.

GLAZING, IMPACT RESISTANT: Glazing that has been shown by testing in accordance with ASTM E1886 and ASTM E1996 or other approved test methods to withstand the impact of wind-borne missiles likely to be generated in wind-borne debris regions during design winds.

HILL: With respect to topographic effects in Section 6.5.7, a land surface characterized by strong relief in any horizontal direction (see Fig. 6-4).

HURRICANE PRONE REGIONS: Areas vulnerable to hurricanes; in the United States and its territories defined as

1. The U.S. Atlantic Ocean and Gulf of Mexico coasts where the basic wind speed is greater than 90 mi/h, and
2. Hawaii, Puerto Rico, Guam, Virgin Islands, and American Samoa.

IMPACT RESISTANT COVERING: A covering designed to protect glazing, which has been shown by testing in accordance with ASTM E1886 and ASTM E1996 or other approved test methods to withstand the impact of wind-borne debris missiles likely to be generated in wind-borne debris regions during design winds.

IMPORTANCE FACTOR, I : A factor that accounts for the degree of hazard to human life and damage to property.

MAIN WIND-FORCE RESISTING SYSTEM (MWFRS): An assemblage of structural elements assigned to provide support and stability for the overall structure. The system generally receives wind loading from more than one surface.

MEAN ROOF HEIGHT, h : The average of the roof eave height and the height to the highest point on the roof surface, except that, for roof angles of less than or equal to 10° , the mean roof height shall be the roof eave height.

OPENINGS: Apertures or holes in the building envelope that allow air to flow through the building envelope and that are designed as "open" during design winds as defined by these provisions.

RECOGNIZED LITERATURE: Published research findings and technical papers that are approved.

RIDGE: With respect to topographic effects in Section 6.5.7 an elongated crest of a hill characterized by strong relief in two directions (see Fig. 6-4).

WIND-BORNE DEBRIS REGIONS: Areas within hurricane prone regions located:

1. Within 1 mile of the coastal mean high water line where the basic wind speed is equal to or greater than 110 mi/h and in Hawaii, or
2. In areas where the basic wind speed is equal to or greater than 120 mi/h.

6.3 SYMBOLS AND NOTATION

The following symbols and notation apply only to the provisions of Chapter 6:

A = effective wind area, in ft^2 (m^2)

A_f = area of open buildings and other structures either normal to the wind direction or projected on a plane normal to the wind direction, in ft^2 (m^2)

A_g = the gross area of that wall in which A_o is identified, in ft^2 (m^2)

A_{gi} = the sum of the gross surface areas of the building envelope (walls and roof) not including A_g , in ft^2 (m^2)

A_o = total area of openings in a wall that receives positive external pressure, in ft^2 (m^2)

A_{oi} = the sum of the areas of openings in the building envelope (walls and roof) not including A_o , in ft^2 (m^2)

A_{og} = total area of openings in the building envelope in ft^2 (m^2)

A_s = gross area of the solid freestanding wall or solid sign, in ft^2 (m^2)

a = width of pressure coefficient zone, in ft (m)

B = horizontal dimension of building measured normal to wind direction, in ft (m)

$\bar{b}$ = mean hourly wind speed factor in Eq. 6-14 from Table 6-2

$\hat{b}$ = 3-s gust speed factor from Table 6-2

C_f = force coefficient to be used in determination of wind loads for other structures

C_N = net pressure coefficient to be used in determination of wind loads for open buildings

C_p = external pressure coefficient to be used in determination of wind loads for buildings

c = turbulence intensity factor in Eq. 6-5 from Table 6-2

D = diameter of a circular structure or member, in ft (m)

D' = depth of protruding elements such as ribs and spoilers, in ft (m)

F = design wind force for other structures, in lb (N)

G = gust effect factor

G_f = gust effect factor for MWFRSs of flexible buildings and other structures

GC_{pn} = combined net pressure coefficient for a parapet

GC_p = product of external pressure coefficient and gust-effect factor to be used in determination of wind loads for buildings

GC_{pf} = product of the equivalent external pressure coefficient and gust-effect factor to be used in determination of wind loads for MWFRS of low-rise buildings
 GC_{pi} = product of internal pressure coefficient and gust-effect factor to be used in determination of wind loads for buildings
 g_Q = peak factor for background response in Eqs. 6-4 and 6-8
 g_R = peak factor for resonant response in Eq. 6-8
 g_v = peak factor for wind response in Eqs. 6-4 and 6-8
 H = height of hill or escarpment in Fig. 6-4, in ft (m)
 h = mean roof height of a building or height of other structure, except that eave height shall be used for roof angle θ of less than or equal to 10° , in ft (m)
 h_e = roof eave height at a particular wall, or the average height if the eave varies along the wall
 I = importance factor
 I_z = intensity of turbulence from Eq. 6-5
 K_1, K_2, K_3 = multipliers in Fig. 6-4 to obtain K_{zt}
 K_d = wind directionality factor in Table 6-4
 K_h = velocity pressure exposure coefficient evaluated at height $z = h$
 K_z = velocity pressure exposure coefficient evaluated at height z
 K_{zt} = topographic factor as defined in Section 6.5.7
 L = horizontal dimension of a building measured parallel to the wind direction, in ft (m)
 L_h = distance upwind of crest of hill or escarpment in Fig. 6-4 to where the difference in ground elevation is half the height of hill or escarpment, in ft (m)
 L_t = integral length scale of turbulence, in ft (m)
 L_r = horizontal dimension of return corner for a solid freestanding wall or solid sign from Fig. 6-20, in ft (m)
 ℓ = integral length scale factor from Table 6-2, ft (m)
 N_1 = reduced frequency from Eq. 6-12
 n_1 = building natural frequency, Hz
 p = design pressure to be used in determination of wind loads for buildings, in lb/ft² (N/m²)
 p_L = wind pressure acting on leeward face in Fig. 6-9, in lb/ft² (N/m²)
 p_{net} = net design wind pressure from Eq. 6-2, in lb/ft² (N/m²)
 p_{net30} = net design wind pressure for Exposure B at $h = 30$ ft and $I = 1.0$ from Fig. 6-3, in lb/ft² (N/m²)
 p_p = combined net pressure on a parapet from Eq. 6-20, in lb/ft² (N/m²)
 p_s = net design wind pressure from Eq. 6-1, in lb/ft² (N/m²)
 p_{s30} = simplified design wind pressure for Exposure B at $h = 30$ ft and $I = 1.0$ from Fig. 6-2, in lb/ft² (N/m²)
 p_w = wind pressure acting on windward face in Fig. 6-9, in lb/ft² (N/m²)
 Q = background response factor from Eq. 6-6

q = velocity pressure, in lb/ft² (N/m²)
 q_h = velocity pressure evaluated at height $z = h$, in lb/ft² (N/m²)
 q_i = velocity pressure for internal pressure determination, in lb/ft² (N/m²)
 q_p = velocity pressure at top of parapet, in lb/ft² (N/m²)
 q_z = velocity pressure evaluated at height z above ground, in lb/ft² (N/m²)
 R = resonant response factor from Eq. 6-10
 R_B, R_h, R_L = values from Eq. 6-13
 R_i = reduction factor from Eq. 6-16
 R_n = value from Eq. 6-11
 s = vertical dimension of the solid freestanding wall or solid sign from Fig. 6-20, in ft (m)
 r = rise-to-span ratio for arched roofs
 V = basic wind speed obtained from Fig. 6-1, in mi/h (m/s). The basic wind speed corresponds to a 3-s gust speed at 33 ft (10 m) above ground in exposure Category C
 V_i = unpartitioned internal volume ft³ (m³)
 $\bar{V}_z$ = mean hourly wind speed at height z , ft/s (m/s)
 W = width of building in Figs. 6-12 and 6-14A and B and width of span in Figs. 6-13 and 6-15, in ft (m)
 X = distance to center of pressure from windward edge in Fig. 6-18, in ft (m)
 x = distance upwind or downwind of crest in Fig. 6-4, in ft (m)
 z = height above ground level, in ft (m)
 $\bar{z}$ = equivalent height of structure, in ft (m)
 z_g = nominal height of the atmospheric boundary layer used in this standard. Values appear in Table 6-2
 z_{min} = exposure constant from Table 6-2
 α = 3-s gust-speed power law exponent from Table 6-2
 $\hat{\alpha}$ = reciprocal of α from Table 6-2
 $\bar{\alpha}$ = mean hourly wind-speed power law exponent in Eq. 6-14 from Table 6-2
 β = damping ratio, percent critical for buildings or other structures
 ϵ = ratio of solid area to gross area for solid freestanding wall, solid sign, open sign, face of a trussed tower, or lattice structure
 λ = adjustment factor for building height and exposure from Figs. 6-2 and 6-3
 $\bar{\epsilon}$ = integral length scale power law exponent in Eq. 6-7 from Table 6-2
 η = value used in Eq. 6-13 (see Section 6.5.8.2)
 θ = angle of plane of roof from horizontal, in degrees
 v = height-to-width ratio for solid sign

6.4 METHOD 1—SIMPLIFIED PROCEDURE

6.4.1 Scope. A building whose design wind loads are determined in accordance with this section shall meet all the conditions of

6.4.1.1 or 6.4.1.2. If a building qualifies only under 6.4.1.2 for design of its components and cladding, then its MWFRS shall be designed by Method 2 or Method 3.

6.4.1.1 Main Wind-Force Resisting Systems. For the design of MWFRS the building must meet all of the following conditions:

1. The building is a simple diaphragm building as defined in Section 6.2.
2. The building is a low-rise building as defined in Section 6.2.
3. The building is enclosed as defined in Section 6.2 and conforms to the wind-borne debris provisions of Section 6.5.9.3.
4. The building is a regular-shaped building or structure as defined in Section 6.2.
5. The building is not classified as a flexible building as defined in Section 6.2.
6. The building does not have response characteristics making it subject to across wind loading, vortex shedding, instability due to galloping or flutter; and does not have a site location for which channeling effects or buffeting in the wake of upwind obstructions warrant special consideration.
7. The building has an approximately symmetrical cross-section in each direction with either a flat roof or a gable or hip roof with $\theta \leq 45^\circ$.
8. The building is exempted from torsional load cases as indicated in Note 5 of Fig. 6-10, or the torsional load cases defined in Note 5 do not control the design of any of the MWFRSs of the building.

6.4.1.2 Components and Cladding. For the design of components and cladding the building must meet all the following conditions:

1. The mean roof height h must be less than or equal to 60 ft ($h \leq 60$ ft).
2. The building is enclosed as defined in Section 6.2 and conforms to the wind-borne debris provisions of Section 6.5.9.3.
3. The building is a regular-shaped building or structure as defined in Section 6.2.
4. The building does not have response characteristics making it subject to across wind loading, vortex shedding, instability due to galloping or flutter; and does not have a site location for which channeling effects or buffeting in the wake of upwind obstructions warrant special consideration.
5. The building has either a flat roof, a gable roof with $\theta \leq 45^\circ$, or a hip roof with $\theta \leq 27^\circ$.

6.4.2 Design Procedure.

1. The *basic wind speed* V shall be determined in accordance with Section 6.5.4. The wind shall be assumed to come from any horizontal direction.
2. An *importance factor* I shall be determined in accordance with Section 6.5.5.
3. An *exposure category* shall be determined in accordance with Section 6.5.6.
4. A height and exposure adjustment coefficient, λ , shall be determined from Fig. 6-2.

6.4.2.1 Main Wind-Force Resisting System. Simplified design wind pressures, p_s , for the MWFRSs of low-rise simple diaphragm buildings represent the net pressures (sum of internal and external) to be applied to the horizontal and vertical projections

of building surfaces as shown in Fig. 6-2. For the horizontal pressures (zones A, B, C, D), p_s is the combination of the windward and leeward net pressures. p_s shall be determined by the following equation:

$$p_s = \lambda K_{zt} I p_{s30} \quad (6-1)$$

where

λ = adjustment factor for building height and exposure from Fig. 6-2

K_{zt} = topographic factor as defined in Section 6.5.7 evaluated at mean roof height, h

I = importance factor as defined in Section 6.2

p_{s30} = simplified design wind pressure for Exposure B, at $h = 30$ ft, and for $I = 1.0$, from Fig. 6-2

6.4.2.1.1 Minimum Pressures. The load effects of the design wind pressures from Section 6.4.2.1 shall not be less than the minimum load case from Section 6.1.4.1 assuming the pressures, p_s , for zones A, B, C, and D all equal to +10 psf, while assuming zones E, F, G, and H all equal to 0 psf.

6.4.2.2 Components and Cladding. Net design wind pressures, p_{net} , for the components and cladding of buildings designed using Method 1 represent the net pressures (sum of internal and external) to be applied normal to each building surface as shown in Fig. 6-3. p_{net} shall be determined by the following equation:

$$p_{net} = \lambda K_{zt} I p_{net30} \quad (6-2)$$

where

λ = adjustment factor for building height and exposure from Fig. 6-3

K_{zt} = topographic factor as defined in Section 6.5.7 evaluated at mean roof height, h

I = importance factor as defined in Section 6.2

p_{net30} = net design wind pressure for exposure B, at $h = 30$ ft, and for $I = 1.0$, from Fig. 6-3

6.4.2.2.1 Minimum Pressures. The positive design wind pressures, p_{net} , from Section 6.4.2.2 shall not be less than +10 psf, and the negative design wind pressures, p_{net} , from Section 6.4.2.2 shall not be less than -10 psf.

6.4.3 Air Permeable Cladding. Design wind loads determined from Fig. 6.3 shall be used for all air permeable cladding unless approved test data or the recognized literature demonstrate lower loads for the type of air permeable cladding being considered.

6.5 METHOD 2—ANALYTICAL PROCEDURE

6.5.1 Scope. A building or other structure whose design wind loads are determined in accordance with this section shall meet all of the following conditions:

1. The building or other structure is a regular-shaped building or structure as defined in Section 6.2.
2. The building or other structure does not have response characteristics making it subject to across wind loading, vortex shedding, instability due to galloping or flutter; or does not have a site location for which channeling effects or buffeting in the wake of upwind obstructions warrant special consideration.

6.5.2 Limitations. The provisions of Section 6.5 take into consideration the load magnification effect caused by gusts in resonance with along-wind vibrations of flexible buildings or other structures. Buildings or other structures not meeting the requirements of Section 6.5.1, or having unusual shapes or response

characteristics, shall be designed using recognized literature documenting such wind load effects or shall use the wind tunnel procedure specified in Section 6.6.

6.5.2.1 Shielding. There shall be no reductions in velocity pressure due to apparent shielding afforded by buildings and other structures or terrain features.

6.5.2.2 Air Permeable Cladding. Design wind loads determined from Section 6.5 shall be used for air permeable cladding unless approved test data or recognized literature demonstrate lower loads for the type of air permeable cladding being considered.

6.5.3 Design Procedure.

1. The *basic wind speed* V and *wind directionality factor* K_d shall be determined in accordance with Section 6.5.4.
2. An *importance factor* I shall be determined in accordance with Section 6.5.5.
3. An *exposure category* or *exposure categories* and *velocity pressure exposure coefficient* K_z or K_h , as applicable, shall be determined for each wind direction in accordance with Section 6.5.6.
4. A *topographic factor* K_{zt} shall be determined in accordance with Section 6.5.7.
5. A *gust effect factor* G or G_f , as applicable, shall be determined in accordance with Section 6.5.8.
6. An *enclosure classification* shall be determined in accordance with Section 6.5.9.
7. *Internal pressure coefficient* GC_{pi} shall be determined in accordance with Section 6.5.11.1.
8. *External pressure coefficients* C_p or GC_{pf} , or *force coefficients* C_f , as applicable, shall be determined in accordance with Section 6.5.11.2 or 6.5.11.3, respectively.
9. *Velocity pressure* q_z or q_h , as applicable, shall be determined in accordance with Section 6.5.10.
10. *Design wind load* p or F shall be determined in accordance with Sections 6.5.12, 6.5.13, 6.5.14, and 6.5.15, as applicable.

6.5.4 Basic Wind Speed. The basic wind speed, V , used in the determination of design wind loads on buildings and other structures shall be as given in Fig. 6-1 except as provided in Sections 6.5.4.1 and 6.5.4.2. The wind shall be assumed to come from any horizontal direction.

6.5.4.1 Special Wind Regions. The basic wind speed shall be increased where records or experience indicate that the wind speeds are higher than those reflected in Fig. 6-1. Mountainous terrain, gorges, and special regions shown in Fig. 6-1 shall be examined for unusual wind conditions. The authority having jurisdiction shall, if necessary, adjust the values given in Fig. 6-1 to account for higher local wind speeds. Such adjustment shall be based on meteorological information and an estimate of the basic wind speed obtained in accordance with the provisions of Section 6.5.4.2.

6.5.4.2 Estimation of Basic Wind Speeds from Regional Climatic Data. In areas outside hurricane-prone regions, regional climatic data shall only be used in lieu of the basic wind speeds given in Fig. 6-1 when (1) approved extreme-value statistical-analysis procedures have been employed in reducing the data; and (2) the length of record, sampling error, averaging time, anemometer height, data quality, and terrain exposure of

the anemometer have been taken into account. Reduction in basic wind speed below that of Fig. 6-1 shall be permitted.

In hurricane-prone regions, wind speeds derived from simulation techniques shall only be used in lieu of the basic wind speeds given in Fig. 6-1 when (1) approved simulation and extreme value statistical analysis procedures are used (the use of regional wind speed data obtained from anemometers is not permitted to define the hurricane wind-speed risk along the Gulf and Atlantic coasts, the Caribbean, or Hawaii) and (2) the design wind speeds resulting from the study shall not be less than the resulting 500-year return period wind speed divided by $\sqrt{1.5}$.

In areas outside hurricane-prone regions, when the basic wind speed is estimated from regional climatic data, the basic wind speed shall be not less than the wind speed associated with an annual probability of 0.02 (50-year mean recurrence interval), and the estimate shall be adjusted for equivalence to a 3-s gust wind speed at 33 ft (10 m) above ground in exposure Category C. The data analysis shall be performed in accordance with this chapter.

6.5.4.3 Limitation. Tornadoes have not been considered in developing the basic wind-speed distributions.

6.5.4.4 Wind Directionality Factor. The wind directionality factor, K_d , shall be determined from Table 6-4. This factor shall only be applied when used in conjunction with load combinations specified in Sections 2.3 and 2.4.

6.5.5 Importance Factor. An importance factor, I , for the building or other structure shall be determined from Table 6-1 based on building and structure categories listed in Table 1-1.

6.5.6 Exposure. For each wind direction considered, the upwind exposure category shall be based on ground surface roughness that is determined from natural topography, vegetation, and constructed facilities.

6.5.6.1 Wind Directions and Sectors. For each selected wind direction at which the wind loads are to be evaluated, the exposure of the building or structure shall be determined for the two upwind sectors extending 45° either side of the selected wind direction. The exposures in these two sectors shall be determined in accordance with Sections 6.5.6.2 and 6.5.6.3 and the exposure resulting in the highest wind loads shall be used to represent the winds from that direction.

6.5.6.2 Surface Roughness Categories. A ground surface roughness within each 45° sector shall be determined for a distance upwind of the site as defined in Section 6.5.6.3 from the categories defined in the following text, for the purpose of assigning an exposure category as defined in Section 6.5.6.3.

Surface Roughness B: Urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of single-family dwellings or larger.

Surface Roughness C: Open terrain with scattered obstructions having heights generally less than 30 ft (9.1 m). This category includes flat open country, grasslands, and all water surfaces in hurricane prone regions.

Surface Roughness D: Flat, unobstructed areas and water surfaces outside hurricane prone regions. This category includes smooth mud flats, salt flats, and unbroken ice.

6.5.6.3 Exposure Categories

Exposure B: Exposure B shall apply where the ground surface roughness condition, as defined by Surface Roughness B, prevails in the upwind direction for a distance of at least 2,600 ft (792 m) or 20 times the height of the building, whichever is greater.

EXCEPTION: For buildings whose mean roof height is less than or equal to 30 ft, the upwind distance may be reduced to 1,500 ft (457 m).

Exposure C: Exposure C shall apply for all cases where Exposures B or D do not apply.

Exposure D: Exposure D shall apply where the ground surface roughness, as defined by Surface Roughness D, prevails in the upwind direction for a distance greater than 5,000 ft (1,524 m) or 20 times the building height, whichever is greater. Exposure D shall extend into downwind areas of Surface Roughness B or C for a distance of 600 ft (200 m) or 20 times the height of the building, whichever is greater.

For a site located in the transition zone between exposure categories, the category resulting in the largest wind forces shall be used.

EXCEPTION: An intermediate exposure between the preceding categories is permitted in a transition zone provided that it is determined by a rational analysis method defined in the recognized literature.

6.5.6.4 Exposure Category for Main Wind-Force Resisting System.

6.5.6.4.1 Buildings and Other Structures. For each wind direction considered, wind loads for the design of the MWFRS determined from Fig. 6-6 shall be based on the exposure categories defined in Section 6.5.6.3.

6.5.6.4.2 Low-Rise Buildings. Wind loads for the design of the MWFRSs for low-rise buildings shall be determined using a velocity pressure q_h based on the exposure resulting in the highest wind loads for any wind direction at the site where external pressure coefficients GC_{pf} given in Fig. 6-10 are used.

6.5.6.5 Exposure Category for Components and Cladding. Components and cladding design pressures for all buildings and other structures shall be based on the exposure resulting in the highest wind loads for any direction at the site.

6.5.6.6 Velocity Pressure Exposure Coefficient. Based on the exposure category determined in Section 6.5.6.3, a velocity pressure exposure coefficient K_z or K_h , as applicable, shall be determined from Table 6-3. For a site located in a transition zone between exposure categories, that is, near to a change in ground surface roughness, intermediate values of K_z or K_h , between those shown in Table 6-3, are permitted, provided that they are determined by a rational analysis method defined in the recognized literature.

6.5.7 Topographic Effects.

6.5.7.1 Wind Speed-Up over Hills, Ridges, and Escarpments. Wind speed-up effects at isolated hills, ridges, and escarpments constituting abrupt changes in the general topography, located in any exposure category, shall be included in the design when buildings and other site conditions and locations of structures meet all of the following conditions:

1. The hill, ridge, or escarpment is isolated and unobstructed upwind by other similar topographic features of comparable height for 100 times the height of the topographic feature ($100H$) or 2 mi (3.22 km), whichever is less. This distance shall be measured horizontally from the point at which the height H of the hill, ridge, or escarpment is determined.
2. The hill, ridge, or escarpment protrudes above the height of upwind terrain features within a 2-mi (3.22 km) radius in any quadrant by a factor of two or more.
3. The structure is located as shown in Fig. 6-4 in the upper one-half of a hill or ridge or near the crest of an escarpment.

4. $H/L_h \geq 0.2$.

5. H is greater than or equal to 15 ft (4.5 m) for Exposures C and D and 60 ft (18 m) for Exposure B.

6.5.7.2 Topographic Factor. The wind speed-up effect shall be included in the calculation of design wind loads by using the factor K_{zt} :

$$K_{zt} = (1 + K_1 K_2 K_3)^2 \quad (6-3)$$

where K_1 , K_2 , and K_3 are given in Fig. 6-4.

If site conditions and locations of structures do not meet all the conditions specified in Section 6.5.7.1 then $K_{zt} = 1.0$.

6.5.8 Gust Effect Factor.

6.5.8.1 Rigid Structures. For rigid structures as defined in Section 6.2, the gust-effect factor shall be taken as 0.85 or calculated by the formula:

$$G = 0.925 \left(\frac{(1 + 1.7g_Q I_z Q)}{1 + 1.7g_v I_z} \right) \quad (6-4)$$

$$I_z = c \left(\frac{33}{z} \right)^{1/6} \quad (6-5)$$

$$\text{In SI: } I_z = c \left(\frac{10}{z} \right)^{1/6}$$

where I_z = the intensity of turbulence at height z where z = the equivalent height of the structure defined as $0.6h$, but not less than $z_{\min}$ for all building heights h . $z_{\min}$ and c are listed for each exposure in Table 6-2; g_Q and g_v shall be taken as 3.4. The background response Q is given by

$$Q = \frac{1}{\sqrt{1 + 0.63 \left(\frac{B + h}{L_z} \right)^{0.63}}} \quad (6-6)$$

where B , h are defined in Section 6.3; and L_z = the integral length scale of turbulence at the equivalent height given by

$$L_z = \ell \left(\frac{z}{33} \right)^{\bar{e}} \quad (6-7)$$

$$\text{In SI: } L_z = \ell \left(\frac{z}{10} \right)^{\bar{e}}$$

in which ℓ and $\bar{e}$ are constants listed in Table 6-2.

6.5.8.2 Flexible or Dynamically Sensitive Structures. For flexible or dynamically sensitive structures as defined in Section 6.2, the gust-effect factor shall be calculated by

$$G_f = 0.925 \left(\frac{1 + 1.7I_z \sqrt{g_Q^2 Q^2 + g_R^2 R^2}}{1 + 1.7g_v I_z} \right) \quad (6-8)$$

g_Q and g_v shall be taken as 3.4 and g_R is given by

$$g_R = \sqrt{2 \ln(3,600n_1)} + \frac{0.577}{\sqrt{2 \ln(3,600n_1)}} \quad (6-9)$$

R , the resonant response factor, is given by

$$R = \sqrt{\frac{1}{\beta} R_n R_h R_B (0.53 + 0.47 R_L)} \quad (6-10)$$

$$R_n = \frac{7.47 N_1}{(1 + 10.3 N_1)^{5/3}} \quad (6-11)$$

$$N_1 = \frac{n_1 L_z}{\bar{V}_z} \quad (6-12)$$

$$R_L = \frac{1}{\eta} - \frac{1}{2\eta^2}(1 - e^{-2\eta}) \quad \text{for } \eta > 0 \quad (6-13a)$$

$$R_L = 1 \quad \text{for } \eta = 0 \quad (6-13b)$$

where the subscript ℓ in Eq. 6-13 shall be taken as h , B , and L , respectively, where h , B , and L are defined in Section 6.3.

n_1 = building natural frequency

$R_L = R_h$ setting $\eta = 4.6n_1 h / \bar{V}_z$

$R_L = R_B$ setting $\eta = 4.6n_1 EB / \bar{V}_z$

$R_L = R_L$ setting $\eta = 15.4n_1 L / \bar{V}_z$

β = damping ratio, percent of critical

$\bar{V}_z$ = mean hourly wind speed (ft/s) at height z determined from Eq. 6-14.

$$\bar{V}_1 = \bar{b} \left(\frac{z}{33} \right)^{\bar{\alpha}} V \left(\frac{88}{60} \right) \quad (6-14)$$

In SI: $\bar{V}_1 = \bar{b} \left(\frac{z}{10} \right)^{\bar{\alpha}} V$

where $\bar{b}$ and $\bar{\alpha}$ are constants listed in Table 6-2 and V is the basic wind speed in mi/h.

6.5.8.3 Rational Analysis. In lieu of the procedure defined in Sections 6.5.8.1 and 6.5.8.2, determination of the gust-effect factor by any rational analysis defined in the recognized literature is permitted.

6.5.8.4 Limitations. Where combined gust-effect factors and pressure coefficients (GC_p , GC_{pi} , and GC_{pf}) are given in figures and tables, the gust-effect factor shall not be determined separately.

6.5.9 Enclosure Classifications.

6.5.9.1 General. For the purpose of determining internal pressure coefficients, all buildings shall be classified as enclosed, partially enclosed, or open as defined in Section 6.2.

6.5.9.2 Openings. A determination shall be made of the amount of openings in the building envelope to determine the enclosure classification as defined in Section 6.5.9.1.

6.5.9.3 Wind-Borne Debris. Glazing in buildings located in wind-borne debris regions shall be protected with an impact-resistant covering or be impact-resistant glazing according to the requirements specified in ASTM E1886 and ASTM E1996 or other approved test methods and performance criteria. The levels of impact resistance shall be a function of Missile Levels and Wind Zones specified in ASTM E1886 and ASTM E1996.

EXCEPTIONS:

1. Glazing in Category II, III, or IV buildings located over 60 ft (18.3 m) above the ground and over 30 ft (9.2 m) above aggregate surface roofs located within 1,500 ft (458 m) of the building shall be permitted to be unprotected.
2. Glazing in Category I buildings shall be permitted to be unprotected.

6.5.9.4 Multiple Classifications. If a building by definition complies with both the "open" and "partially enclosed" definitions, it shall be classified as an "open" building. A building that does not comply with either the "open" or "partially enclosed" definitions shall be classified as an "enclosed" building.

6.5.10 Velocity Pressure. Velocity pressure, q_z , evaluated at height z shall be calculated by the following equation:

$$q_z = 0.00256 K_z K_{zt} K_d V^2 I \quad (\text{lb/ft}^2) \quad (6-15)$$

[In SI: $q_z = 0.613 K_z K_{zt} K_d V^2 I$ (N/m²); V in m/s]

where K_d is the wind directionality factor defined in Section 6.5.4.4, K_z is the velocity pressure exposure coefficient defined in Section 6.5.6.6, K_{zt} is the topographic factor defined in Section 6.5.7.2, and q_h is the velocity pressure calculated using Eq. 6-15 at mean roof height h .

The numerical coefficient 0.00256 (0.613 in SI) shall be used except where sufficient climatic data are available to justify the selection of a different value of this factor for a design application.

6.5.11 Pressure and Force Coefficients.

6.5.11.1 Internal Pressure Coefficient. Internal pressure coefficients, GC_{pi} , shall be determined from Fig. 6-5 based on building enclosure classifications determined from Section 6.5.9.

6.5.11.1.1 Reduction Factor for Large Volume Buildings, R_t . For a partially enclosed building containing a single, unpartitioned large volume, the internal pressure coefficient, GC_{pi} , shall be multiplied by the following reduction factor, R_t :

$$R_t = 1.0 \quad \text{or}$$

$$R_t = 0.5 \left(1 + \frac{1}{\sqrt{1 + \frac{V_t}{22,800 A_{og}}}} \right) \leq 1.0 \quad (6-16)$$

where

A_{og} = total area of openings in the building envelope (walls and roof, in ft²)

V_t = unpartitioned internal volume, in ft³

6.5.11.2 External Pressure Coefficients.

6.5.11.2.1 Main Wind-Force Resisting Systems. External pressure coefficients for MWFRSs C_p are given in Figs. 6-6, 6-7, and 6-8. Combined gust effect factor and external pressure coefficients, GC_{pf} , are given in Fig. 6-10 for low-rise buildings. The pressure coefficient values and gust effect factor in Fig. 6-10 shall not be separated.

6.5.11.2.2 Components and Cladding. Combined gust-effect factor and external pressure coefficients for components and cladding GC_p are given in Figs. 6-11 through 6-17. The pressure coefficient values and gust-effect factor shall not be separated.

6.5.11.3 Force Coefficients. Force coefficients C_f are given in Figs. 6-20 through 6-23.

6.5.11.4 Roof Overhangs.

6.5.11.4.1 Main Wind-Force Resisting System. Roof overhangs shall be designed for a positive pressure on the bottom surface of windward roof overhangs corresponding to $C_p = 0.8$ in combination with the pressures determined from using Figs. 6-6 and 6-10.

6.5.11.4.2 Components and Cladding. For all buildings, roof overhangs shall be designed for pressures determined from pressure coefficients given in Figs. 6-11B, C, D.

6.5.11.5 Parapets.

6.5.11.5.1 Main Wind-Force Resisting System. The pressure coefficients for the effect of parapets on the MWFRS loads are given in Section 6.5.12.2.4

6.5.1.1.52 Components and Cladding. The pressure coefficients for the design of parapet component and cladding elements are taken from the wall and roof pressure coefficients as specified in Section 6.5.12.4.4.

6.5.12 Design Wind Loads on Enclosed and Partially Enclosed Buildings.

6.5.12.1 General.

6.5.12.1.1 Sign Convention. Positive pressure acts toward the surface and negative pressure acts away from the surface.

6.5.12.1.2 Critical Load Condition. Values of external and internal pressures shall be combined algebraically to determine the most critical load.

6.5.12.1.3 Tributary Areas Greater than 700 ft² (65 m²). Component and cladding elements with tributary areas greater than 700 ft² (65 m²) shall be permitted to be designed using the provisions for MWFRS.

6.5.12.2 Main Wind-Force Resisting Systems.

6.5.12.2.1 Rigid Buildings of All Heights. Design wind pressures for the MWFRS of buildings of all heights shall be determined by the following equation:

$$p = qG C_p - q_i(GC_{pi}) \text{ (lb/ft}^2 \text{) (N/m}^2 \text{)} \quad (6-17)$$

where

$q = q_z$ for windward walls evaluated at height z above the ground

$q = q_h$ for leeward walls, side walls, and roofs, evaluated at height h

$q_i = q_h$ for windward walls, side walls, leeward walls, and roofs of enclosed buildings and for negative internal pressure evaluation in partially enclosed buildings

$q_i = q_z$ for positive internal pressure evaluation in partially enclosed buildings where height z is defined as the level of the highest opening in the building that could affect the positive internal pressure. For buildings sited in wind-borne debris regions, glazing that is not impact resistant or protected with an impact resistant covering, shall be treated as an opening in accordance with Section 6.5.9.3. For positive internal pressure evaluation, q_i may conservatively be evaluated at height h ($q_i = q_h$)

G = gust effect factor from Section 6.5.8

C_p = external pressure coefficient from Fig. 6-6 or 6-8

(GC_{pi}) = internal pressure coefficient from Fig. 6-5

q and q_i shall be evaluated using exposure defined in Section 6.5.6.3. Pressure shall be applied simultaneously on windward and leeward walls and on roof surfaces as defined in Figs. 6-6 and 6-8.

6.5.12.2.2 Low-Rise Building. Alternatively, design wind pressures for the MWFRS of low-rise buildings shall be determined by the following equation:

$$p = q_h[(GC_{pf}) - (GC_{pi})] \text{ (lb/ft}^2 \text{) (N/m}^2 \text{)} \quad (6-18)$$

here

q_h = velocity pressure evaluated at mean roof height h using exposure defined in Section 6.5.6.3

(C_{pf}) = external pressure coefficient from Fig. 6-10

(C_{pi}) = internal pressure coefficient from Fig. 6-5

6.5.12.2.3 Flexible Buildings. Design wind pressures for the MWFRS of flexible buildings shall be determined from the following equation:

$$p = qG_f C_p - q_i(GC_{pi}) \text{ (lb/ft}^2 \text{) (N/m}^2 \text{)} \quad (6-19)$$

where q , q_i , C_p , and (GC_{pi}) are as defined in Section 6.5.12.2.1 and G_f = gust effect factor is defined as in Section 6.5.8.2.

6.5.12.2.4 Parapets. The design wind pressure for the effect of parapets on MWFRSs of rigid, low-rise, or flexible buildings with flat, gable, or hip roofs shall be determined by the following equation:

$$p_p = q_p GC_{pn} \text{ (lb/ft}^2 \text{)} \quad (6-20)$$

where

p_p = combined net pressure on the parapet due to the combination of the net pressures from the front and back parapet surfaces. Plus (and minus) signs signify net pressure acting toward (and away from) the front (exterior) side of the parapet

q_p = velocity pressure evaluated at the top of the parapet

GC_{pn} = combined net pressure coefficient

= +1.5 for windward parapet

= -1.0 for leeward parapet

6.5.12.3 Design Wind Load Cases. The MWFRS of buildings of all heights, whose wind loads have been determined under the provisions of Sections 6.5.12.2.1 and 6.5.12.2.3, shall be designed for the wind load cases as defined in Fig. 6-9. The eccentricity e for rigid structures shall be measured from the geometric center of the building face and shall be considered for each principal axis (e_x , e_y). The eccentricity e for flexible structures shall be determined from the following equation and shall be considered for each principal axis (e_x , e_y):

$$e = \frac{e_Q + 1.7I_z \sqrt{(g_Q Q e_Q)^2 + (g_R R e_R)^2}}{1 + 1.7I_z \sqrt{(g_Q Q)^2 + (g_R R)^2}} \quad (6-21)$$

where

e_Q = eccentricity e as determined for rigid structures in Fig. 6-9

e_R = distance between the elastic shear center and center of mass of each floor

I_z , g_Q , Q , g_R , R shall be as defined in Section 6.5.8

The sign of the eccentricity e shall be plus or minus, whichever causes the more severe load effect.

EXCEPTION: One-story buildings with h less than or equal to 30 ft, buildings two stories or less framed with light-frame construction, and buildings two stories or less designed with flexible diaphragms need only be designed for Load Case 1 and Load Case 3 in Fig. 6-9.

6.5.12.4 Components and Cladding.

6.5.12.4.1 Low-Rise Buildings and Buildings with $h \leq 60$ ft (18.3 m). Design wind pressures on component and cladding elements of low-rise buildings and buildings with $h \leq 60$ ft (18.3 m) shall be determined from the following equation:

$$p = q_h[(GC_p) - (GC_{pi})] \text{ (lb/ft}^2 \text{) (N/m}^2 \text{)} \quad (6-22)$$

where

q_h = velocity pressure evaluated at mean roof height h using exposure defined in Section 6.5.6.3

(GC_p) = external pressure coefficients given in Figs. 6-11 through 6-16

(GC_{pi}) = internal pressure coefficient given in Fig. 6-5

6.5.12.4.2 Buildings with $h > 60$ ft (18.3 m). Design wind pressures on components and cladding for all buildings with $h > 60$ ft (18.3 m) shall be determined from the following equation:

$$p = q(GC_p) - q_i(GC_{pi}) \text{ (lb/ft}^2\text{) (N/m}^2\text{)} \quad (6-23)$$

where

$q = q_z$ for windward walls calculated at height z above the ground

$q = q_h$ for leeward walls, side walls, and roofs, evaluated at height h

$q_i = q_h$ for windward walls, side walls, leeward walls, and roofs of enclosed buildings and for negative internal pressure evaluation in partially enclosed buildings

$q_i = q_z$ for positive internal pressure evaluation in partially enclosed buildings where height z is defined as the level of the highest opening in the building that could affect the positive internal pressure. For buildings sited in wind-borne debris regions, glazing that is not impact resistant or protected with an impact-resistant covering, shall be treated as an opening in accordance with Section 6.5.9.3. For positive internal pressure evaluation, q_i may conservatively be evaluated at height h ($q_i = q_h$)

(GC_p) = external pressure coefficient from Fig. 6-17

(GC_{pi}) = internal pressure coefficient given in Fig. 6-5.

q and q_i shall be evaluated using exposure defined in Section 6.5.6.3.

6.5.12.4.3 Alternative Design Wind Pressures for Components and Cladding in Buildings with 60 ft (18.3 m) $< h < 90$ ft (27.4 m). Alternative to the requirements of Section 6.5.12.4.2, the design of components and cladding for buildings with a mean roof height greater than 60 ft (18.3 m) and less than 90 ft (27.4 m) values from Figs. 6-11 through 6-17 shall be used only if the height to width ratio is one or less (except as permitted by Note 6 of Fig. 6-17) and Eq. 6-22 is used.

6.5.12.4.4 Parapets. The design wind pressure on the components and cladding elements of parapets shall be designed by the following equation:

$$p = q_p(GC_p - GC_{pi}) \quad (6-24)$$

where

q_p = velocity pressure evaluated at the top of the parapet

GC_p = external pressure coefficient from Figs. 6-11 through 6-17

GC_{pi} = internal pressure coefficient from Fig. 6-5, based on the porosity of the parapet envelope

Two load cases shall be considered. Load Case A shall consist of applying the applicable positive wall pressure from Fig. 6-11A or Fig. 6-17 to the front surface of the parapet while applying the applicable negative edge or corner zone roof pressure from Figs. 6-11 through 6-17 to the back surface. Load Case B shall consist of applying the applicable positive wall pressure from Fig. 6-11A or Fig. 6-17 to the back of the parapet surface, and applying the applicable negative wall pressure from Fig. 6-11A or Fig. 6-17 to the front surface. Edge and corner zones shall be arranged as shown in Figs. 6-11 through 6-17. GC_p shall be determined for appropriate roof angle and effective wind area from Figs. 6-11 through 6-17. If internal pressure is present, both load cases should be evaluated under positive and negative internal pressure.

6.5.13 Design Wind Loads on Open Buildings with Monoslope, Pitched, or Troughed Roofs.

6.5.13.1 General.

6.5.13.1.1 Sign Convention. Plus and minus signs signify pressure acting toward and away from the top surface of the roof, respectively.

6.5.13.1.2 Critical Load Condition. Net pressure coefficients C_N include contributions from top and bottom surfaces. All load cases shown for each roof angle shall be investigated.

6.5.13.2 Main Wind-Force Resisting Systems. The net design pressure for the MWFRSs of monoslope, pitched, or troughed roofs shall be determined by the following equation:

$$p = q_h GC_N \quad (6-25)$$

where

q_h = velocity pressure evaluated at mean roof height h using the exposure as defined in Section 6.5.6.3 that results in the highest wind loads for any wind direction at the site

G = gust effect factor from Section 6.5.8

C_N = net pressure coefficient determined from Figs. 6-18A through 6-18D

For free roofs with an angle of plane of roof from horizontal θ less than or equal to 5° and containing fascia panels, the fascia panel shall be considered an inverted parapet. The contribution of loads on the fascia to the MWFRS loads shall be determined using Section 6.5.12.2.4 with q_p equal to q_h .

6.5.13.3 Component and Cladding Elements. The net design wind pressure for component and cladding elements of monoslope, pitched, and troughed roofs shall be determined by the following equation:

$$p = q_h GC_N \quad (6-26)$$

where

q_h = velocity pressure evaluated at mean roof height h using the exposure as defined in Section 6.5.6.3 that results in the highest wind loads for any wind direction at the site

G = gust-effect factor from Section 6.5.8

C_N = net pressure coefficient determined from Figs. 6-19A through 6-19C

6.5.14 Design Wind Loads on Solid Freestanding Walls and Solid Signs. The design wind force for solid freestanding walls and solid signs shall be determined by the following formula:

$$F = q_h GC_f A_s \text{ (lb) (N)} \quad (6-27)$$

where

q_h = the velocity pressure evaluated at height h (defined in Fig. 6-20) using exposure defined in Section 6.5.6.4.1

G = gust-effect factor from Section 6.5.8

C_f = net force coefficient from Fig. 6-20

A_s = the gross area of the solid freestanding wall or solid sign, in ft^2 (m^2)

6.5.15 Design Wind Loads on Other Structures. The design wind force for other structures shall be determined by the following equation:

$$F = q_z GC_f A_f \text{ (lb) (N)} \quad (6-28)$$

where

q_z = velocity pressure evaluated at height z of the centroid of area A_f using exposure defined in Section 6.5.6.3

G = gust-effect factor from Section 6.5.8

C_f = force coefficients from Figs. 6-21 through 6-23

A_f = projected area normal to the wind except where C_f is specified for the actual surface area, ft^2 (m^2)

6.5.15.1 Rooftop Structures and Equipment for Buildings with $h \leq 60$ ft (18.3 m). The force on rooftop structures and equipment with A_f less than $(0.1Bh)$ located on buildings with $h \leq 60$ ft (18.3 m) shall be determined from Eq. 6-28, increased by a factor of 1.9. The factor shall be permitted to be reduced linearly from 1.9 to 1.0 as the value of A_f is increased from $(0.1Bh)$ to (Bh) .

6.6 METHOD 3—WIND TUNNEL PROCEDURE

6.6.1 Scope. Wind tunnel tests shall be used where required by Section 6.5.2. Wind tunnel testing shall be permitted in lieu of Methods 1 and 2 for any building or structure.

6.6.2 Test Conditions. Wind tunnel tests, or similar tests employing fluids other than air, used for the determination of design wind loads for any building or other structure, shall be conducted in accordance with this section. Tests for the determination of mean and fluctuating forces and pressures shall meet all of the following conditions:

1. The natural atmospheric boundary layer has been modeled to account for the variation of wind speed with height.
2. The relevant macro- (integral) length and micro-length scales of the longitudinal component of atmospheric turbulence are modeled to approximately the same scale as that used to model the building or structure.
3. The modeled building or other structure and surrounding structures and topography are geometrically similar to their full-scale counterparts, except that, for low-rise buildings meeting the requirements of Section 6.5.1, tests shall be permitted for the modeled building in a single exposure site as defined in Section 6.5.6.3.
4. The projected area of the modeled building or other structure and surroundings is less than 8 percent of the test section cross-sectional area unless correction is made for blockage.
5. The longitudinal pressure gradient in the wind tunnel test section is accounted for.
6. Reynolds number effects on pressures and forces are minimized.

7. Response characteristics of the wind tunnel instrumentation are consistent with the required measurements.

6.6.3 Dynamic Response. Tests for the purpose of determining the dynamic response of a building or other structure shall be in accordance with Section 6.6.2. The structural model and associated analysis shall account for mass distribution, stiffness, and damping.

6.6.4 Limitations.

6.6.4.1 Limitations on Wind Speeds. Variation of basic wind speeds with direction shall not be permitted unless the analysis for wind speeds conforms to the requirements of Section 6.5.4.2.

6.6.5 Wind-Borne Debris. Glazing in buildings in wind-borne debris regions shall be protected in accordance with Section 6.5.9.3.

6.7 CONSENSUS STANDARDS AND OTHER REFERENCED DOCUMENTS

This section lists the consensus standards and other documents which are adopted by reference within this chapter:

ASTM

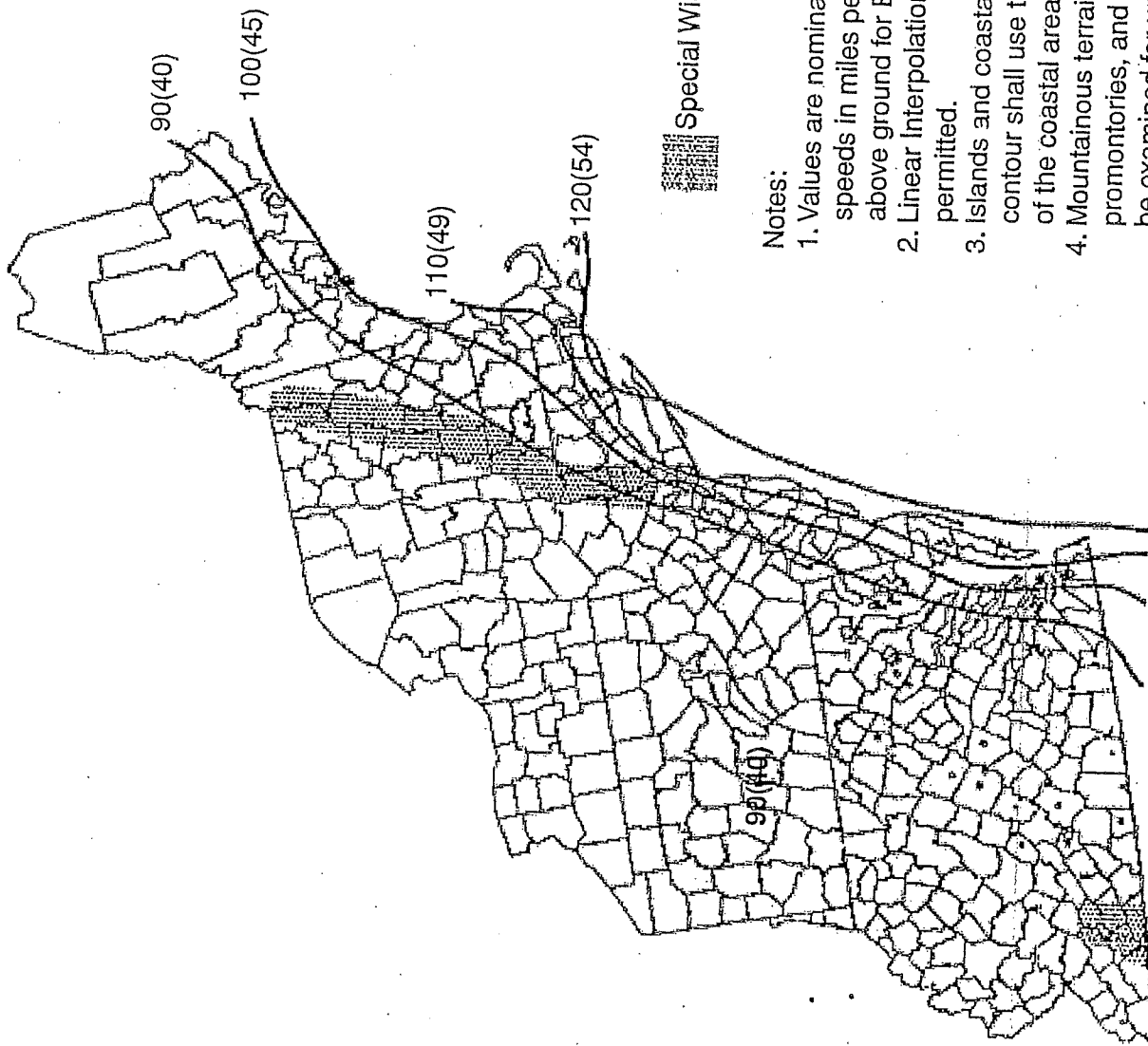
ASTM International
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959

ASTM E1886

Section 6.5.9.3
Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials, 2002.

ASTM E1996

Section 6.5.9.3
Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Windborne Debris in Hurricanes, 2003.



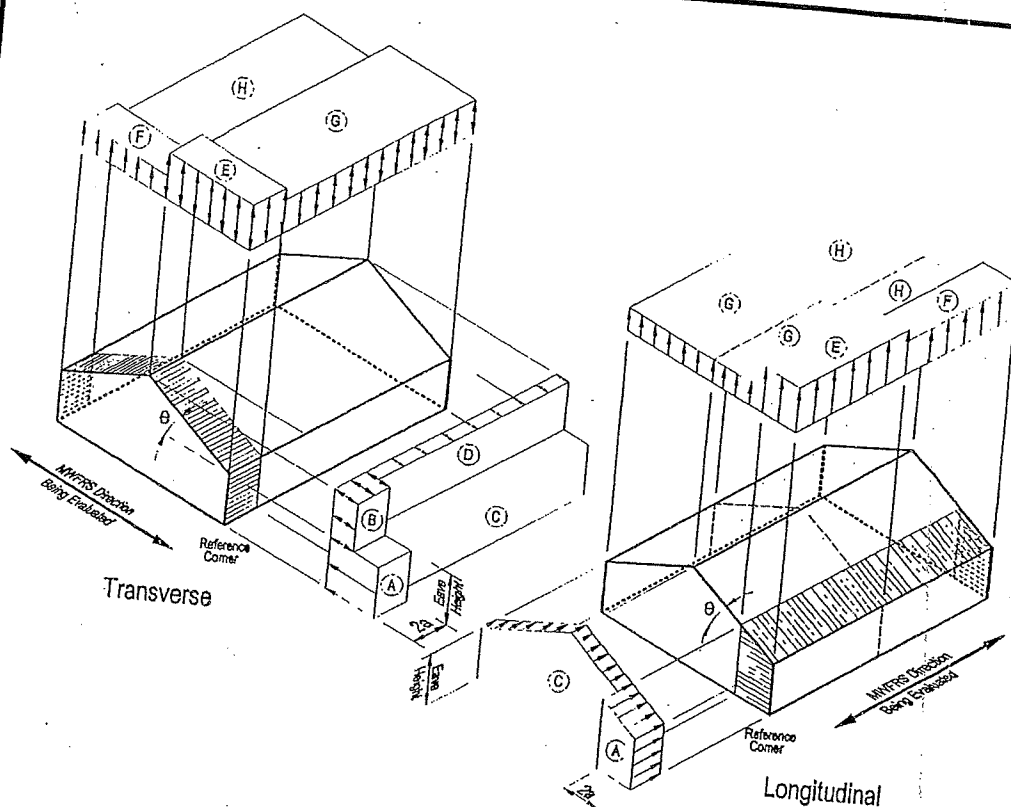
Special Wind Region

Notes:

1. Values are nominal design 3-second gust wind speeds in miles per hour (m/s) at 33 ft (10 m) above ground for Exposure C category.
2. Linear Interpolation between wind contours is permitted.
3. Islands and coastal areas outside the last contour shall use the last wind speed contour of the coastal area.
4. Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.

FIGURE 6-1C BASIC WIND SPEED—MID AND NORTHERN ATLANTIC HURRICANE COASTLINE

Main Wind Force Resisting System – Method 1		
Figure 6-2	Design Wind Pressures	$h \leq 60$ ft.
Enclosed Buildings		Walls & Roofs



Notes:

- Pressures shown are applied to the horizontal and vertical projections, for exposure B, at $h=30$ ft (9.1m), $I=1.0$, and $K_{zt}=1.0$. Adjust to other conditions using Equation 6-1.
- The load patterns shown shall be applied to each corner of the building in turn as the reference corner. (See Figure 6-10)
- For the design of the longitudinal MWFRS use $\theta = 0^\circ$, and locate the zone E/F, G/H boundary at the mid-length of the building.
- Load cases 1 and 2 must be checked for $25^\circ < \theta \leq 45^\circ$. Load case 2 at 25° is provided only for interpolation between 25° to 30° .
- Plus and minus signs signify pressures acting toward and away from the projected surfaces, respectively.
- For roof slopes other than those shown, linear interpolation is permitted.
- The total horizontal load shall not be less than that determined by assuming $p_s = 0$ in zones B & D.
- The zone pressures represent the following:
Horizontal pressure zones – Sum of the windward and leeward net (sum of internal and external) pressures on vertical projection of:
A – End zone of wall
B – End zone of roof
C – Interior zone of wall
D – Interior zone of roof
Vertical pressure zones – Net (sum of internal and external) pressures on horizontal projection of:
E – End zone of windward roof
F – End zone of leeward roof
G – Interior zone of windward roof
H – Interior zone of leeward roof
- Where zone E or G falls on a roof overhang on the windward side of the building, use E_{OH} and G_{OH} for the pressure on the horizontal projection of the overhang. Overhangs on the leeward and side edges shall have the basic zone pressure applied.
- Notation:
a: 10 percent of least horizontal dimension or $0.4h$, whichever is smaller, but not less than either 4% of least horizontal dimension or 3 ft (0.9 m).
h: Mean roof height, in feet (meters), except that eave height shall be used for roof angles $< 10^\circ$.
 θ : Angle of plane of roof from horizontal, in degrees.

Main Wind Force Resisting System – Method 1

 $h \leq 60$ ft.

Figure 6-2 (cont'd)

Design Wind Pressures

Walls & Roofs

Enclosed Buildings

Simplified Design Wind Pressure, p_{s30} (psf) (Exposure B at $h = 30$ ft., $K_H = 1.0$, with $I = 1.0$)

Basic Wind Speed (mph)	Roof Angle (degrees)	Load Case	Zones									
			Horizontal Pressures				Vertical Pressures				Overhangs	
			A	B	C	D	E	F	G	H	ECH	GCH
85	0 to 5°	1	11.5	-5.9	7.6	-3.5	-13.8	-7.8	-9.6	-6.1	-19.3	-15.1
	10°	1	12.9	-5.4	8.6	-3.1	-13.8	-8.4	-9.6	-6.5	-19.3	-15.1
	15°	1	14.4	-4.8	9.6	-2.7	-13.8	-9.0	-9.6	-6.9	-19.3	-15.1
	20°	1	15.9	-4.2	10.6	-2.3	-13.8	-9.6	-9.6	-7.3	-19.3	-15.1
	25°	1	14.4	2.3	10.4	2.4	-6.4	-8.7	-4.6	-7.0	-11.9	-10.1
		2	—	—	—	—	-2.4	-4.7	-0.7	-3.0	—	—
	30 to 45	1	12.9	8.8	10.2	7.0	1.0	-7.8	0.3	-6.7	-4.5	-5.2
		2	12.9	8.8	10.2	7.0	5.0	-3.9	4.3	-2.8	-4.5	-5.2
90	0 to 5°	1	12.8	-6.7	8.5	-4.0	-15.4	-8.8	-10.7	-6.8	-21.6	-16.9
	10°	1	14.5	-6.0	9.6	-3.5	-15.4	-9.4	-10.7	-7.2	-21.6	-16.9
	15°	1	16.1	-5.4	10.7	-3.0	-15.4	-10.1	-10.7	-7.7	-21.6	-16.9
	20°	1	17.8	-4.7	11.9	-2.6	-15.4	-10.7	-10.7	-8.1	-21.6	-16.9
	25°	1	16.1	2.6	11.7	2.7	-7.2	-9.8	-5.2	-7.8	-13.3	-11.4
		2	—	—	—	—	-2.7	-5.3	-0.7	-3.4	—	—
	30 to 45	1	14.4	9.9	11.5	7.9	1.1	-8.8	0.4	-7.5	-5.1	-5.8
		2	14.4	9.9	11.5	7.9	5.6	-4.3	4.8	-3.1	-5.1	-5.8
100	0 to 5°	1	15.9	-8.2	10.5	-4.9	-19.1	-10.8	-13.3	-8.4	-26.7	-20.9
	10°	1	17.9	-7.4	11.9	-4.3	-19.1	-11.6	-13.3	-8.9	-26.7	-20.9
	15°	1	19.9	-6.6	13.3	-3.8	-19.1	-12.4	-13.3	-9.5	-26.7	-20.9
	20°	1	22.0	-5.8	14.6	-3.2	-19.1	-13.3	-13.3	-10.1	-26.7	-20.9
	25°	1	19.9	3.2	14.4	3.3	-8.8	-12.0	-6.4	-9.7	-16.5	-14.0
		2	—	—	—	—	-3.4	-6.6	-0.9	-4.2	—	—
	30 to 45	1	17.8	12.2	14.2	9.8	1.4	-10.8	0.5	-9.3	-6.3	-7.2
		2	17.8	12.2	14.2	9.8	6.9	-5.3	5.9	-3.8	-6.3	-7.2
105	0 to 5°	1	17.5	-9.0	11.6	-5.4	-21.1	-11.9	-14.7	-9.3	-29.4	-23.0
	10°	1	19.7	-8.2	13.1	-4.7	-21.1	-12.8	-14.7	-9.8	-29.4	-23.0
	15°	1	21.9	-7.3	14.7	-4.2	-21.1	-13.7	-14.7	-10.5	-29.4	-23.0
	20°	1	24.3	-6.4	16.1	-3.5	-21.1	-14.7	-14.7	-11.1	-29.4	-23.0
	25°	1	21.9	3.5	15.9	3.5	-9.7	-13.2	-7.1	-10.7	-18.2	-15.4
		2	—	—	—	—	-3.7	-7.3	-1.0	-4.6	—	—
	30 to 45	1	19.6	13.5	15.7	10.8	1.5	-11.9	0.6	-10.3	-6.9	-7.9
		2	19.6	13.5	15.7	10.8	7.6	-5.8	6.5	-4.2	-6.9	-7.9
110	0 to 5°	1	19.2	-10.0	12.7	-5.9	-23.1	-13.1	-16.0	-10.1	-32.3	-25.3
	10°	1	21.6	-9.0	14.4	-5.2	-23.1	-14.1	-16.0	-10.8	-32.3	-25.3
	15°	1	24.1	-8.0	16.0	-4.6	-23.1	-15.1	-16.0	-11.5	-32.3	-25.3
	20°	1	26.6	-7.0	17.7	-3.9	-23.1	-16.0	-16.0	-12.2	-32.3	-25.3
	25°	1	24.1	3.9	17.4	4.0	-10.7	-14.6	-7.7	-11.7	-19.9	-17.0
		2	—	—	—	—	-4.1	-7.9	-1.1	-5.1	—	—
	30 to 45	1	21.6	14.8	17.2	11.8	1.7	-13.1	0.6	-11.3	-7.6	-8.7
		2	21.6	14.8	17.2	11.8	8.3	-6.5	7.2	-4.6	-7.6	-8.7
120	0 to 5°	1	22.8	-11.9	15.1	-7.0	-27.4	-15.6	-19.1	-12.1	-38.4	-30.1
	10°	1	25.8	-10.7	17.1	-6.2	-27.4	-16.8	-19.1	-12.9	-38.4	-30.1
	15°	1	28.7	-9.5	19.1	-5.4	-27.4	-17.9	-19.1	-13.7	-38.4	-30.1
	20°	1	31.6	-8.3	21.1	-4.6	-27.4	-19.1	-19.1	-14.5	-38.4	-30.1
	25°	1	28.6	4.6	20.7	4.7	-12.7	-17.3	-9.2	-13.9	-23.7	-20.2
		2	—	—	—	—	-4.8	-9.4	-1.3	-6.0	—	—
	30 to 45	1	25.7	17.6	20.4	14.0	2.0	-15.6	0.7	-13.4	-9.0	-10.3
		2	25.7	17.6	20.4	14.0	9.9	-7.7	8.6	-5.5	-9.0	-10.3

Unit Conversions--1.0 ft = 0.3048 m; 1.0 psf = 0.0479 kN/m²

Main Wind Force Resisting System – Method 1

 $h \leq 60$ ft.

Figure 6-2 (cont'd)

Design Wind Pressures

Enclosed Buildings

Walls & Roofs

Adjustment Factor
for Building Height and Exposure, λ

Mean roof height (ft)	Exposure		
	B	C	D
15	1.00	1.21	1.47
20	1.00	1.29	1.55
25	1.00	1.35	1.61
30	1.00	1.40	1.66
35	1.05	1.45	1.70
40	1.09	1.49	1.74
45	1.12	1.53	1.78
50	1.16	1.56	1.81
55	1.19	1.59	1.84
60	1.22	1.62	1.87

Importance Factor, I (Wind Loads)

Table 6-1

Category	Non-Hurricane Prone Regions and Hurricane Prone Regions with $V = 85-100$ mph and Alaska	Hurricane Prone Regions with $V > 100$ mph
I	0.87	0.77
II	1.00	1.00
III	1.15	1.15
IV	1.15	1.15

Note:

1. The building and structure classification categories are listed in Table 1-1.

ATTACHMENT B

Chapter 7 SNOW LOADS

7.1 SYMBOLS AND NOTATION

- C_e = exposure factor as determined from Table 7-2
 C_s = slope factor as determined from Fig. 7-2
 C_t = thermal factor as determined from Table 7-3
 h_b = height of balanced snow load determined by dividing p_f by γ , in ft (m)
 h_c = clear height from top of balanced snow load to (1) closest point on adjacent upper roof, (2) top of parapet, or (3) top of a projection on the roof, in ft (m)
 h_d = height of snow drift, in ft (m)
 h_o = height of obstruction above the surface of the roof, in ft (m)
 I = importance factor as determined from Table 7-4
 l_u = length of the roof upwind of the drift, in ft (m)
 L = roof length parallel to the ridge line, in ft (m)
 p_d = maximum intensity of drift surcharge load, in lb/ft² (kN/m²)
 p_f = snow load on flat roofs ("flat" = roof slope $\leq 5^\circ$), in lb/ft² (kN/m²)
 p_g = ground snow load as determined from Fig. 7-1 and Table 7-1; or a site-specific analysis, in lb/ft² (kN/m²)
 p_s = sloped roof snow load, in lb/ft² (kN/m²)
 s = separation distance between buildings, in ft (m)
 S = roof slope run for a rise of one
 θ = roof slope on the leeward side, in degrees
 w = width of snow drift, in ft (m)
 W = horizontal distance from eave to ridge, in ft (m)
 γ = snow density, in lb/ft³ (kN/m³) as determined from Eq. 7-3

7.2 GROUND SNOW LOADS, p_g

Ground snow loads, p_g , to be used in the determination of design snow loads for roofs shall be as set forth in Fig. 7-1 for the contiguous United States and Table 7-1 for Alaska. Site-specific case studies shall be made to determine ground snow loads in areas designated CS in Fig. 7-1. Ground snow loads for sites at elevations above the limits indicated in Fig. 7-1 and for all sites within the CS areas shall be approved by the authority having jurisdiction. Ground snow load determination for such sites shall be based on an extreme value statistical analysis of data available in the vicinity of the site using a value with a 2 percent annual probability of being exceeded (50-year mean recurrence interval).

Snow loads are zero for Hawaii, except in mountainous regions as determined by the authority having jurisdiction.

7.3 FLAT ROOF SNOW LOADS, p_f

The snow load, p_f , on a roof with a slope equal to or less than 5° (1 in./ft = 4.76%) shall be calculated in lb/ft² (kN/m²) using the following formula:

$$p_f = 0.7 C_e C_t I p_g \quad (7-1)$$

but not less than the following minimum values for low slope roofs as defined in Section 7.3.4:

where p_g is 20 lb/ft² (0.96 kN/m²) or less,

$$p_f = (I) p_g \text{ (Importance factor times } p_g \text{)}$$

where p_g exceeds 20 lb/ft² (0.96 kN/m²),

$$p_f = 20(I) \text{ (20 lb/ft}^2 \text{ times Importance factor)}$$

7.3.1 Exposure Factor, C_e . The value for C_e shall be determined from Table 7-2.

7.3.2 Thermal Factor, C_t . The value for C_t shall be determined from Table 7-3.

7.3.3 Importance Factor, I . The value for I shall be determined from Table 7-4.

7.3.4 Minimum Values of p_f for Low-Slope Roofs. Minimum values of p_f shall apply to monoslope roofs with slopes less than 15° , hip and gable roofs with slopes less than the larger of 2.38° (1/2 on 12) and $(70/W) + 0.5$ with W in ft (in SI: $21.3/W + 0.5$, with W in m), and curved roofs where the vertical angle from the eaves to the crown is less than 10° .

7.4 SLOPED ROOF SNOW LOADS, p_s

Snow loads acting on a sloping surface shall be assumed to act on the horizontal projection of that surface. The sloped roof snow load, p_s , shall be obtained by multiplying the flat roof snow load, p_f , by the roof slope factor, C_s :

$$p_s = C_s p_f \quad (7-2)$$

Values of C_s for warm roofs, cold roofs, curved roofs, and multiple roofs are determined from Sections 7.4.1 through 7.4.4. The thermal factor, C_t , from Table 7-3 determines if a roof is "cold" or "warm." "Slippery surface" values shall be used only where the roof's surface is unobstructed and sufficient space is available below the eaves to accept all the sliding snow. A roof shall be considered unobstructed if no objects exist on it that prevent snow on it from sliding. Slippery surfaces shall include metal, slate, glass, and bituminous, rubber, and plastic membranes with a smooth surface. Membranes with an imbedded aggregate or mineral granule surface shall not be considered smooth. Asphalt shingles, wood shingles, and shakes shall not be considered slippery.

7.4.1 Warm Roof Slope Factor, C_s . For warm roofs ($C_t \leq 1.0$ as determined from Table 7-3) with an unobstructed slippery surface that will allow snow to slide off the eaves, the roof slope factor C_s shall be determined using the dashed line in Fig. 7-2a, provided that for nonventilated warm roofs, their thermal resistance (R-value) equals or exceeds 30 ft² h °F/Btu (5.3 °C m²/W) and for warm ventilated roofs, their R-value equals or exceeds 20 ft² h °F/Btu (3.5 °C m²/W). Exterior air shall be able to circulate freely under a ventilated roof from its eaves to its ridge. For warm roofs that do not meet the aforementioned conditions, the solid line in Fig. 7-2a shall be used to determine the roof slope factor C_s .

7.4.2 Cold Roof Slope Factor, C_s . Cold roofs are those with a $C_i > 1.0$ as determined from Table 7-3. For cold roofs with $C_i = 1.1$ and an unobstructed slippery surface that will allow snow to slide off the eaves, the roof slope factor C_s shall be determined using the dashed line in Fig. 7-2b. For all other cold roofs with $C_i = 1.1$, the solid line in Fig. 7-2b shall be used to determine the roof slope factor C_s . For cold roofs with $C_i = 1.2$ and an unobstructed slippery surface that will allow snow to slide off the eaves, the roof slope factor C_s shall be determined using the dashed line in Fig. 7-2c. For all other cold roofs with $C_i = 1.2$, the solid line in Fig. 7-2c shall be used to determine the roof slope factor C_s .

7.4.3 Roof Slope Factor for Curved Roofs. Portions of curved roofs having a slope exceeding 70° shall be considered free of snow load (i.e., $C_s = 0$). Balanced loads shall be determined from the balanced load diagrams in Fig. 7-3 with C_s determined from the appropriate curve in Fig. 7-2.

7.4.4 Roof Slope Factor for Multiple Folded Plate, Sawtooth, and Barrel Vault Roofs. Multiple folded plate, sawtooth, or barrel vault roofs shall have a $C_s = 1.0$, with no reduction in snow load because of slope (i.e., $p_s = p_f$).

7.4.5 Ice Dams and Icicles Along Eaves. Two types of warm roofs that drain water over their eaves shall be capable of sustaining a uniformly distributed load of $2p_f$ on all overhanging portions: those that are unventilated and have an R-value less than $30 \text{ ft}^2 \text{ h } ^\circ\text{F/Btu}$ ($5.3 \text{ } ^\circ\text{C m}^2/\text{W}$) and those that are ventilated and have an R-value less than $20 \text{ ft}^2 \text{ h } ^\circ\text{F/Btu}$ ($3.5 \text{ } ^\circ\text{C m}^2/\text{W}$). No other loads except dead loads shall be present on the roof when this uniformly distributed load is applied.

7.5 PARTIAL LOADING

The effect of having selected spans loaded with the balanced snow load and remaining spans loaded with half the balanced snow load shall be investigated as follows:

7.5.1 Continuous Beam Systems. Continuous beam systems shall be investigated for the effects of the three loadings shown in Fig. 7-4:

Case 1: Full balanced snow load on either exterior span and half the balanced snow load on all other spans.

Case 2: Half the balanced snow load on either exterior span and full balanced snow load on all other spans.

Case 3: All possible combinations of full balanced snow load on any two adjacent spans and half the balanced snow load on all other spans. For this case there will be $(n-1)$ possible combinations where n equals the number of spans in the continuous beam system.

If a cantilever is present in any of the above cases, it shall be considered to be a span.

Partial load provisions need not be applied to structural members that span perpendicular to the ridgeline in gable roofs with slopes greater than the larger of 2.38° ($1/2$ on 12) and $70/W + 0.5$ with W in ft (in SI: $21.3/W + 0.5$, with W in m).

7.5.2 Other Structural Systems. Areas sustaining only half the balanced snow load shall be chosen so as to produce the greatest effects on members being analyzed.

7.6 UNBALANCED ROOF SNOW LOADS

Balanced and unbalanced loads shall be analyzed separately. Winds from all directions shall be accounted for when establishing unbalanced loads.

7.6.1 Unbalanced Snow Loads for Hip and Gable Roofs. For hip and gable roofs with a slope exceeding 70° or with a slope less than the larger of $70/W + 0.5$ with W in ft (in SI: $21.3/W + 0.5$, with W in m) and 2.38° ($1/2$ on 12) unbalanced snow loads are not required to be applied. Roofs with an eave to ridge distance, W , of 20 ft (6.1 m) or less, having simply supported prismatic members spanning from ridge to eave shall be designed to resist an unbalanced uniform snow load on the leeward side equal to Ip_g . For these roofs the windward side shall be unloaded. For all other gable roofs, the unbalanced load shall consist of $0.3p_s$ on the windward side, p_s on the leeward side plus a rectangular surcharge with magnitude $h_d\gamma/\sqrt{S}$ and horizontal extent from the ridge $8\sqrt{S}h_d/3$ where h_d is the drift height from Fig. 7-9 with l_u equal to the eave to ridge distance for the windward portion of the roof, W . Balanced and unbalanced loading diagrams are presented in Fig. 7-5.

7.6.2 Unbalanced Snow Loads for Curved Roofs. Portions of curved roofs having a slope exceeding 70° shall be considered free of snow load. If the slope of a straight line from the eaves (or the 70° point, if present) to the crown is less than 10° or greater than 60° , unbalanced snow loads shall not be taken into account.

Unbalanced loads shall be determined according to the loading diagrams in Fig. 7-3. In all cases the windward side shall be considered free of snow. If the ground or another roof abuts a Case II or Case III (see Fig. 7-3) curved roof at or within 3 ft (0.91 m) of its eaves, the snow load shall not be decreased between the 30° point and the eaves, but shall remain constant at the 30° point value. This distribution is shown as a dashed line in Fig. 7-3.

7.6.3 Unbalanced Snow Loads for Multiple Folded Plate, Sawtooth, and Barrel Vault Roofs. Unbalanced loads shall be applied to folded plate, sawtooth, and barrel-vaulted multiple roofs with a slope exceeding $3/8 \text{ in./ft}$ (1.79°). According to Section 7.4.4, $C_s = 1.0$ for such roofs, and the balanced snow load equals p_f . The unbalanced snow load shall increase from one-half the balanced load at the ridge or crown (i.e., $0.5p_f$) to two times the balanced load given in Section 7.4.4 divided by C_s at the valley (i.e., $2p_f/C_s$). Balanced and unbalanced loading diagrams for a sawtooth roof are presented in Fig. 7-6. However, the snow surface above the valley shall not be at an elevation higher than the snow above the ridge. Snow depths shall be determined by dividing the snow load by the density of that snow from Eq. 7-3, which is in Section 7.7.1.

7.6.4 Unbalanced Snow Loads for Dome Roofs. Unbalanced snow loads shall be applied to domes and similar rounded structures. Snow loads, determined in the same manner as for curved roofs in Section 7.6.2, shall be applied to the downwind 90° sector in plan view. At both edges of this sector, the load shall decrease linearly to zero over sectors of 22.5° each. There shall be no snow load on the remaining 225° upwind sector.

7.7 DRIFTS ON LOWER ROOFS (AERODYNAMIC SHADE)

Roofs shall be designed to sustain localized loads from snowdrifts that form in the wind shadow of (1) higher portions of the same structure and (2) adjacent structures and terrain features.

7.7.1 Lower Roof of a Structure. Snow that forms drifts comes from a higher roof or, with the wind from the opposite direction, from the roof on which the drift is located. These two kinds of drifts ("leeward" and "windward" respectively) are shown in Fig. 7-7. The geometry of the surcharge load due to snow drifting shall be approximated by a triangle as shown in Fig. 7-8. Drift loads shall be superimposed on the balanced snow load. If h_d/h_b is less than 0.2, drift loads are not required to be applied.

For leeward drifts, the drift height h_d shall be determined directly from Fig. 7-9 using the length of the upper roof. For windward drifts, the drift height shall be determined by substituting the length of the lower roof for l_u in Fig. 7-9 and using three-quarters of h_d as determined from Fig. 7-9 as the drift height. The larger of these two heights shall be used in design. If this height is equal to or less than h_c , the drift width, w , shall equal $4h_d$ and the drift height shall equal h_d . If this height exceeds h_c , the drift width, w , shall equal $4h_d^2/h_c$ and the drift height shall equal h_c . However, the drift width, w , shall not be greater than $8h_c$. If the drift width, w , exceeds the width of the lower roof, the drift shall be truncated at the far edge of the roof, not reduced to zero there. The maximum intensity of the drift surcharge load, p_d , equals $h_d\gamma$ where snow density, γ , is defined in Eq. 7-3:

$$\gamma = 0.13p_g + 14 \text{ but not more than } 30 \text{ pcf} \quad (7-3)$$

(in SI: $\gamma = 0.426p_g + 2.2$, but not more than 4.7 kN/m^3)

This density shall also be used to determine h_b by dividing p_s by γ (in SI: also multiply by 102 to get the depth in m).

7.7.2 Adjacent Structures and Terrain Features. The requirements in Section 7.7.1 shall also be used to determine drift loads caused by a higher structure or terrain feature within 20 ft (6.1 m) of a roof. The separation distance, s , between the roof and adjacent structure or terrain feature shall reduce applied drift loads on the lower roof by the factor $(20-s)/20$ where s is in ft ($[(6.1-s)/6.1]$ where s is in m).

7.8 ROOF PROJECTIONS

The method in Section 7.7.1 shall be used to calculate drift loads on all sides of roof projections and at parapet walls. The height of such drifts shall be taken as three-quarters the drift height from Fig. 7-9 (i.e., $0.75h_d$) with l_u equal to the length of the roof upwind of the projection or parapet wall. If the side of a roof projection

is less than 15 ft (4.6 m) long, a drift load is not required to be applied to that side.

7.9 SLIDING SNOW

The load caused by snow sliding off a sloped roof onto a lower roof shall be determined for slippery upper roofs with slopes greater than $1/4$ on 12, and for other (i.e., nonslippery) upper roofs with slopes greater than 2 on 12. The total sliding load per unit length of eave shall be $0.4p_f W$, where W is the horizontal distance from the eave to ridge for the sloped upper roof. The sliding load shall be distributed uniformly on the lower roof over a distance of 15 ft from the upper roof eave. If the width of the lower roof is less than 15 ft, the sliding load shall be reduced proportionally.

The sliding snow load shall not be further reduced unless a portion of the snow on the upper roof is blocked from sliding onto the lower roof by snow already on the lower roof or is expected to slide clear of the lower roof.

Sliding loads shall be superimposed on the balanced snow load.

7.10 RAIN-ON-SNOW SURCHARGE LOAD

For locations where p_g is 20 lb/ft^2 (0.96 kN/m^2) or less, but not zero, all roofs with slopes (in degrees) less than $W/50$ with W in ft (in SI: $W/15.2$ with W in m) shall have a 5 lb/ft^2 (0.24 kN/m^2) rain-on-snow surcharge. This rain-on-snow augmented design load applies only to the balanced load case and need not be used in combination with drift, sliding, unbalanced, or partial loads.

7.11 PONDING INSTABILITY

Roofs shall be designed to preclude ponding instability. For roofs with a slope less than $1/4 \text{ in./ft}$ (1.19°), roof deflections caused by full snow loads shall be investigated when determining the likelihood of ponding instability from rain-on-snow or from snow meltwater (see Section 8.4).

7.12 EXISTING ROOFS

Existing roofs shall be evaluated for increased snow loads caused by additions or alterations. Owners or agents for owners of an existing lower roof shall be advised of the potential for increased snow loads where a higher roof is constructed within 20 ft (6.1 m). See footnote to Table 7-2 and Section 7.7.2.

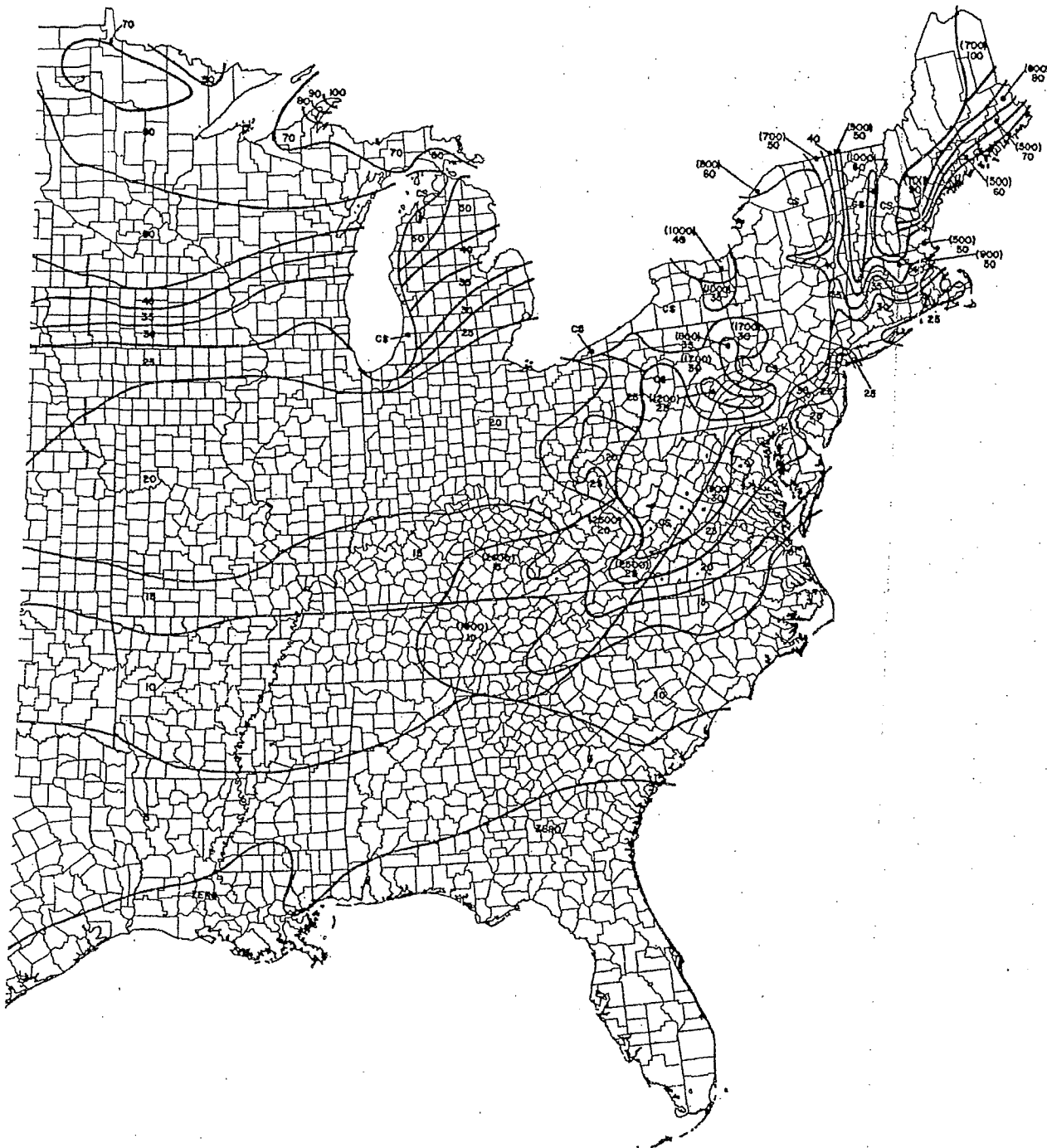


FIGURE 7-1 (continued) GROUND SNOW LOADS, P_g , FOR THE UNITED STATES (LB/FT²)

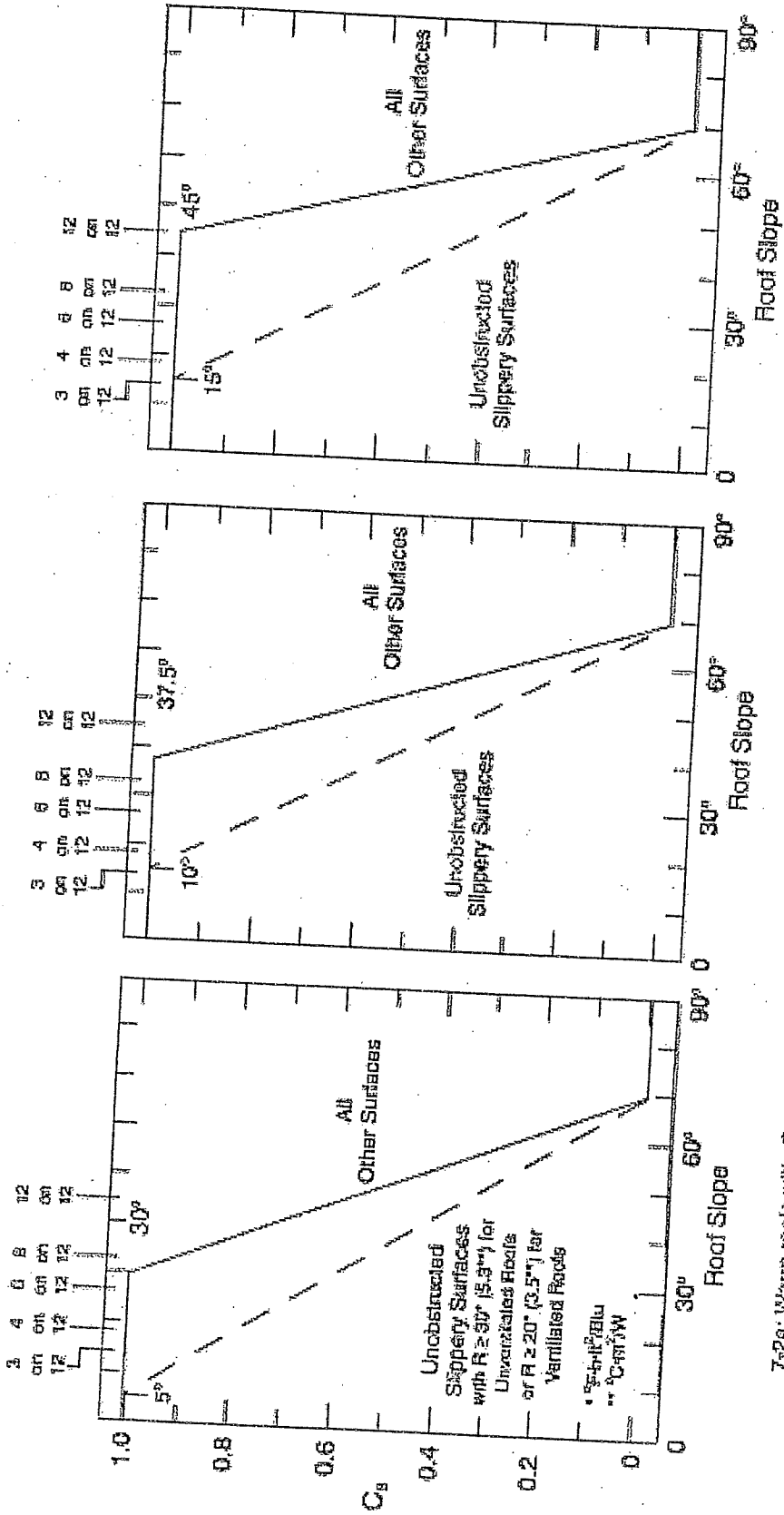
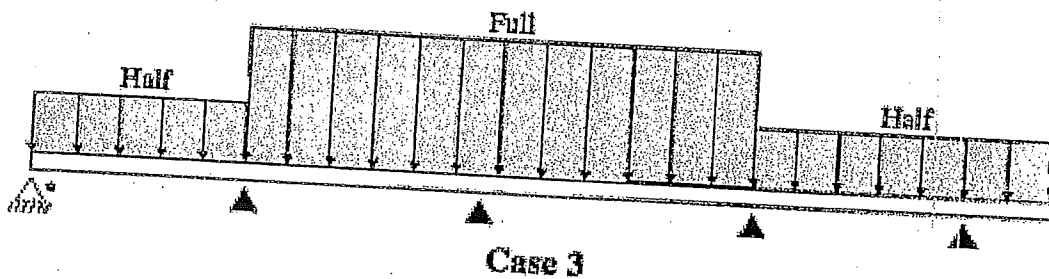
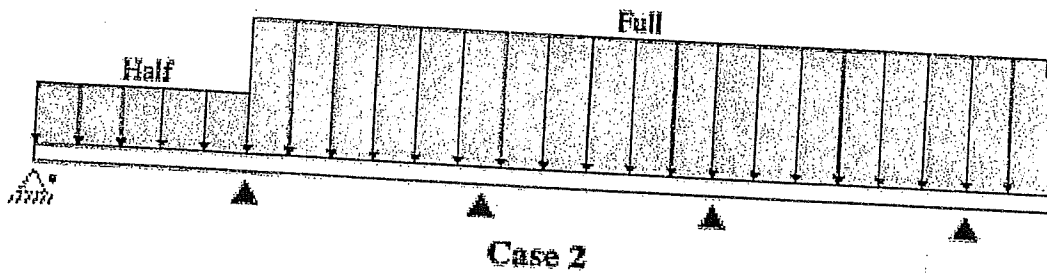
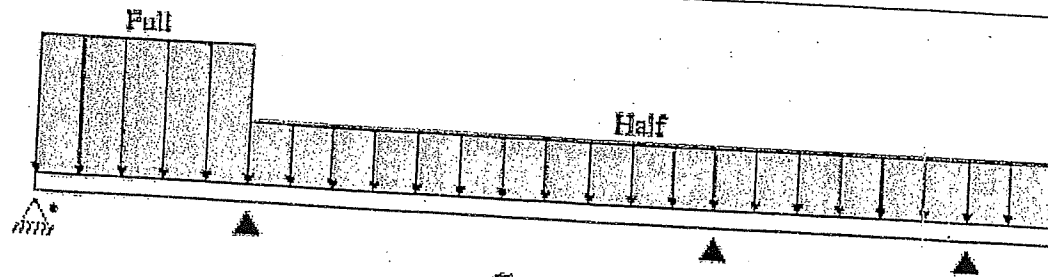


FIGURE 7-2 GRAPHS FOR DETERMINING ROOF SLOPE FACTOR C_s FOR WARM AND COLD ROOFS (SEE TABLE 7-3 FOR C_i DEFINITIONS)



* The left supports are dashed since they would not exist when a cantilever is present.

FIGURE 7-4 PARTIAL LOADING DIAGRAMS FOR CONTINUOUS BEAMS

TABLE 7-1 GROUND SNOW LOADS, P_g , FOR ALASKAN LOCATIONS

Location	P_g		Location	P_g		Location	P_g	
	lb/ft ²	(kN/m ²)		lb/ft ²	(kN/m ²)		lb/ft ²	(kN/m ²)
Adak	30	(1.4)	Galena	60	(2.9)	Petersburg	150	(7.2)
Anchorage	50	(2.4)	Gulkana	70	(3.4)	St Paul	40	(1.9)
Angoon	70	(3.4)	Homer	40	(1.9)	Seward	50	(2.4)
Barrow	25	(1.2)	Juneau	60	(2.9)	Shemya	25	(1.2)
Barter	35	(1.7)	Kenai	70	(3.4)	Sitka	50	(2.4)
Bethel	40	(1.9)	Kodiak	30	(1.4)	Talkeetna	120	(5.8)
Big Delta	50	(2.4)	Kotzebue	60	(2.9)	Unalakleet	50	(2.4)
Cold Bay	25	(1.2)	McGrath	70	(3.4)	Valdez	160	(7.7)
Cordova	100	(4.8)	Nenana	80	(3.8)	Whittier	300	(14.4)
Fairbanks	60	(2.9)	Nome	70	(3.4)	Wrangell	60	(2.9)
Fort Yukon	60	(2.9)	Palmer	50	(2.4)	Yakutat	150	(7.2)

TABLE 7-2 EXPOSURE FACTOR, C_e

Terrain Category	Fully Exposed	Exposure of Roof ^a Partially Exposed	Sheltered
B (see Section 6.5.6)	0.9	1.0	1.2
C (see Section 6.5.6)	0.9	1.0	1.1
D (see Section 6.5.6)	0.8	0.9	1.0
Above the treeline in windswept mountainous areas.	0.7	0.8	N/A
In Alaska, in areas where trees do not exist within a 2-mile (3 km) radius of the site.	0.7	0.8	N/A

The terrain category and roof exposure condition chosen shall be representative of the anticipated conditions during the life of the structure. An exposure factor shall be determined for each roof of a structure.

^aDefinitions: Partially Exposed: All roofs except as indicated in the following text. Fully Exposed: Roofs exposed on all sides with no shelter^b afforded by terrain, higher structures, or trees. Roofs that contain several large pieces of mechanical equipment, parapets that extend above the height of the balanced snow load (h_b), or other obstructions are not in this category. Sheltered: Roofs located tight in among conifers that qualify as obstructions.

^bObstructions within a distance of $10h_o$ provide "shelter," where h_o is the height of the obstruction above the roof level. If the only obstructions are a few deciduous trees that are leafless in winter, the "fully exposed" category shall be used. Note that these are heights above the roof. Heights used to establish the terrain category in Section 6.5.3 are heights above the ground.

TABLE 7-3 THERMAL FACTOR, C_t

Thermal Condition ^a	C_t
All structures except as indicated below:	1.0
Structures kept just above freezing and others with cold, ventilated roofs in which the thermal resistance (R-value) between the ventilated space and the heated space exceeds $25 \text{ }^\circ\text{F} \times \text{h} \times \text{ft}^2/\text{Btu}$ ($4.4 \text{ K} \times \text{m}^2/\text{W}$).	1.1
Unheated structures and structures intentionally kept below freezing.	1.2
Continuously heated greenhouses ^b with a roof having a thermal resistance (R-value) less than $2.0 \text{ }^\circ\text{F} \times \text{h} \times \text{ft}^2/\text{Btu}$ ($0.4 \text{ K} \times \text{m}^2/\text{W}$)	0.85

^aThese conditions shall be representative of the anticipated conditions during winters for the life of the structure.

^bGreenhouses with a constantly maintained interior temperature of $50 \text{ }^\circ\text{F}$ ($10 \text{ }^\circ\text{C}$) or more at any point 3 ft above the floor level during winters and having either a maintenance attendant on duty at all times or a temperature alarm system to provide warning in the event of a heating failure.

TABLE 7-4 IMPORTANCE FACTOR, I (SNOW LOADS)

Category ^a	I
I	0.8
II	1.0
III	1.1
IV	1.2

^aSee Section 1.5 and Table 1-1.

ATTACHMENT C

Solar Panel Dead Weight Calculation

1. A typical solar panel consists of four (4) solar modules and one roof mounting system. The mounting system has six (6) points of contact with the roof.

2. Panel Weight Calculation:

$$\text{Solar Module Weight} = 33 \text{ lbs.}$$

$$\text{Mounting System Weight} = 15 \text{ lbs.}$$

$$\text{Total Panel Weight} = (4 \times 33) + 15 = 147 \text{ lbs.}$$

3. Point Load Calculation:

$$\begin{aligned} \text{Point Load} &= \frac{\text{Total Panel Weight}}{\text{Number of Points of Support}} \\ &= \frac{147 \text{ lbs.}}{6 \text{ Supports}} = 24.5 \text{ lbs.} \end{aligned}$$

4. Distributed Load Calculation:

$$\text{Solar Module Area} = 31.42'' \times 61.39'' = 13.40 \text{ ft}^2$$

$$\text{Total Solar Module Area} = 4 \times 13.40 = 53.6 \text{ ft}^2$$

$$\text{Inter-module spacing} = 0.5''$$

$$\begin{aligned} \text{Total spacing area} &= 3 \times 0.5'' \times 58.1'' = 0.6 \text{ ft}^2 \\ & \text{(3 spaces between 4 modules)} \end{aligned}$$

$$\text{Distributed Load} = \frac{\text{Total Panel Weight}}{\text{Total Panel Area}}$$

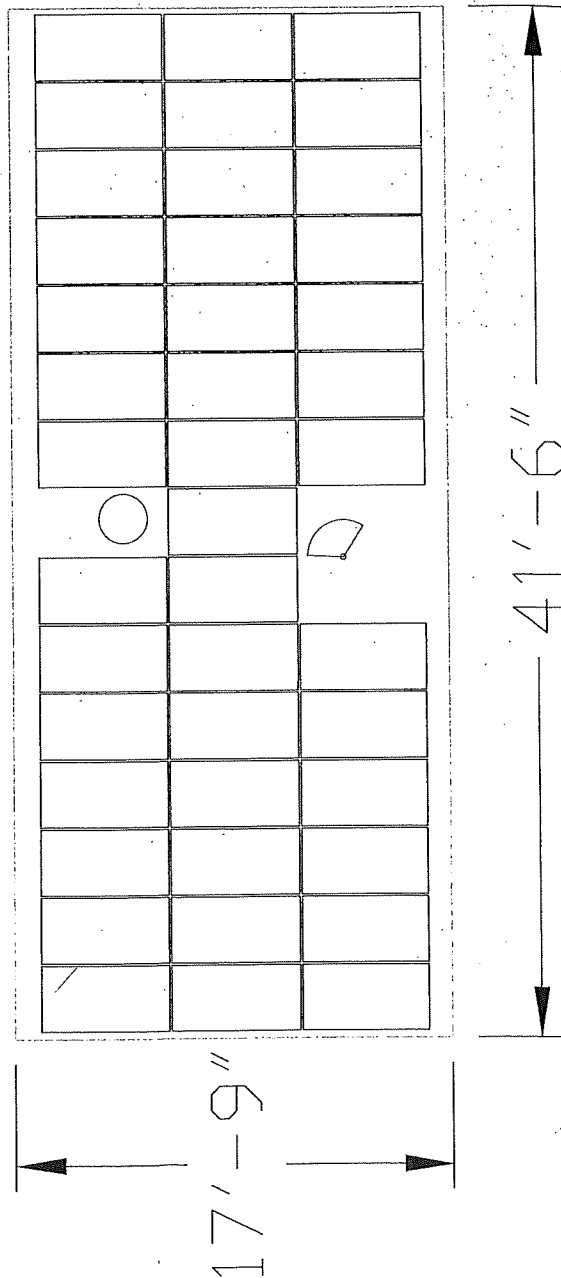
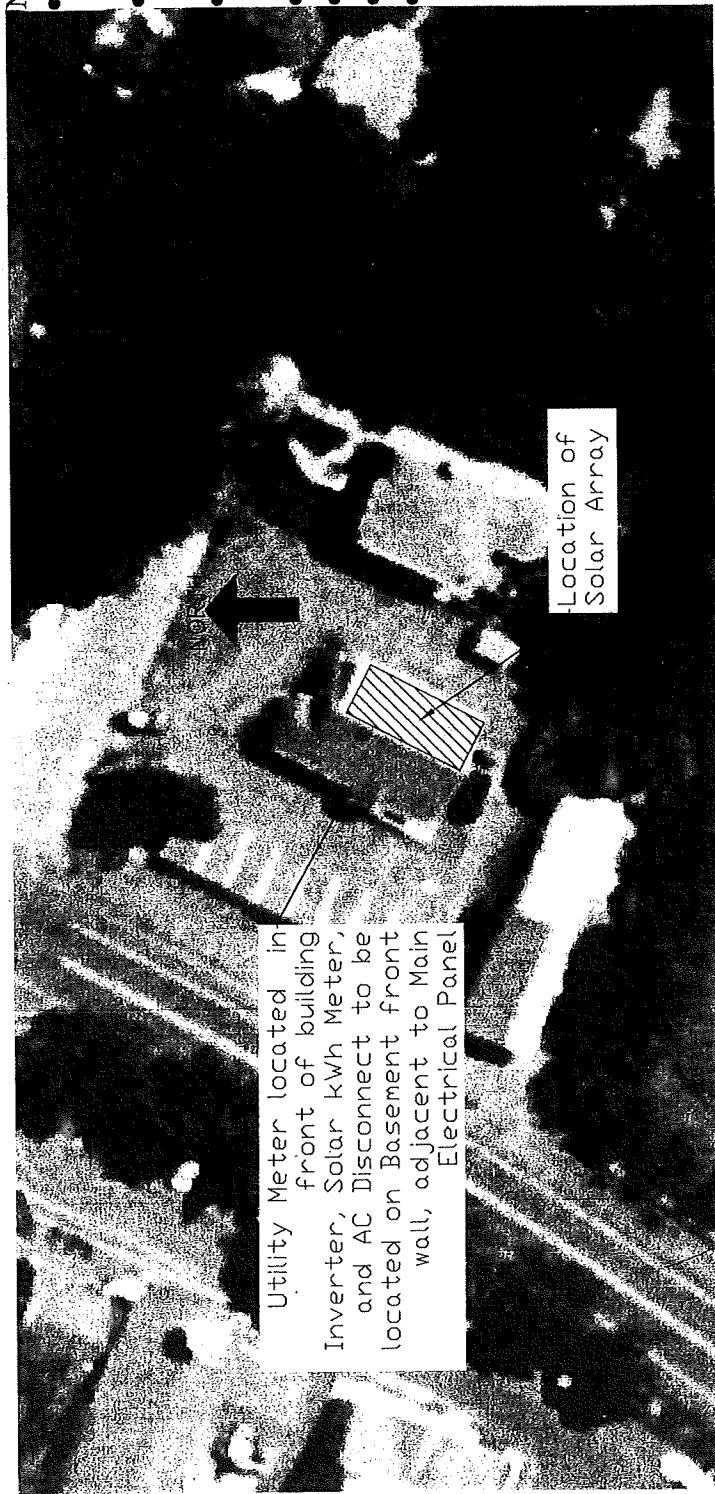
$$= \frac{147 \text{ lbs}}{54.2 \text{ ft}^2} = 2.7 \text{ lbs/ft}^2$$

The point loading and distributed loading is below common building department requirements for structural analysis.

ATTACHMENT D

NOTES:

- Panel Type and Quantity:
(42) SunTech STP185-24/Ab-1
- Racking System:
UniRac SolarMount
- Recommended Inverter(s):
(2) SMA SB 4000US
- DC Power Output: 7.77 kW
- Roof Height: 2 Stories
- Roof Tilt: 9°
- Azimuth: 117°



MERCURY SOLAR SYSTEMS	
36 Midland Ave Port Chester, NY 10573 (P) 914-637-9700 (F) 914-637-9713	
	
CUSTOMER NAME Eyemax Lasik 200 New Road Linwood, NJ 08221	
DRAWN BY: WC	DATE: 10/15/2010
CHECKED BY: ----	LAYOUT
SCALE: N.T.S.	REV. #1
DRAWING# 01083 L.A.0 REV DATE: 11/17/2010	

ISA Drawing Template

Site Name & Address:

EYE MAX LASIK Center 200 New Rd. Linwood, N.J. 08221

Required Info:

Roof Dimensions
Roof Height
Roof Pitch
Orientation of building
Inverter Location
Meter Location
Soffit depth
Rafter Dimensions

Obstructions:

Measure from edge of roof, not from other obstructions

Measure round obstructions to center and provide diameter (width) of circle

Measure rectangular obstructions to one corner and provide size of rectangle from that corner

Provide height for all obstructions.

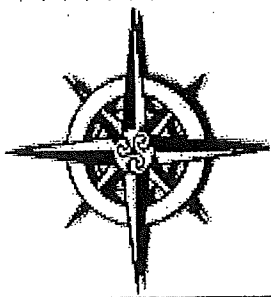
Measure difference in roof heights if using multiple roofs.

Measure from top of dormers to ridge of roof

Note material of each obstruction if possible (PVC, copper, ...)

* Critical - Note if a vent pipe is for a heating system, these cannot be covered by panels

Note parapet height and width if applicable



BACK Roof
TRSE 80.75

61' 9"

Back of Blotches
41' 6"

N

72' 8"

Tilt 9°

pipe 12" high
metal

22' 2"

power vent x 9" high
24" round

19' 7"

4' 0"

81' 8"

Ridge

Some Shading

Front Roof

Panel placement in basement
in inverter

Match

F Roof

John Pletsosante 9-29-10



Field Rep: _____

Date: 9-29-10

Customer Name: EYEMAX LASIK Center PC (CARUSO)

Address: 200 NEW Rd. Linwood, N.J. 08221

Salesperson's Name: John Pietrosante Cell: 774-0466

Electrical:

Type of Service (circle): 120/240 120/208 277/480

Phases (circle): Single 3W Three 4W (STINGER LEG _____)

Type of Service (Main) (circle): 150A 200A 400A 600A 800A Other _____

Panel Make/Model: Outlet Hammer

Analyze Breaker Capacity: NO ROOM

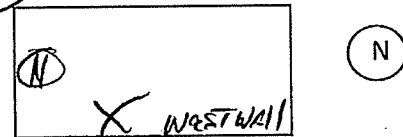
Panel Condition (circle): Good Fair Poor Description: NO

Water meter Jumped (circle): Yes No Not Visible / Found

Clamp Condition (circle): Good Fair Poor

Ground Rods Outside (circle): Yes No

Electrode Conductor Size: 6 #



Inverter Location/Conduit Run (also mark in box w/ orientation): in Basement

Next to panel box over top to Basement Front wall

Penetrations (circle): Yes No How Many _____

Roof:

Roof Type (circle): Existing Re-roof New Construction

How Many Layers Are Visible (circle): 1 2 3

Roofing Material (circle): Single-Ply ASPH SHINGLES EDPM TPO PVC

Modified Bitumen (circle): Capsheet Gravel Smooth

Built-Up Roof (circle): Capsheet Gravel Smooth

Attachment (circle): Fully Adhered Mechanically Ballasted

Soffit Overhang Depth: _____

Roof Access: Hatch Ladder Ladder Size required: 32 (feet)

Rolled Roof with ASph coatings

Round 24" x 9" High



Vent Types: Material: LPowder vent 1- 3" pipe Bath Heat Vent
metal 12" High

Roof Condition: bubbles alligators cracking soft areas pooling # layers of shingles _____

General description: Good

NYC & COMMERCIAL PROJECTS - Note roof drainage locations on sketch or describe here _____

Shading Report : Please use SunEye to complete a shading analysis. 7 (check)

Azimuth: 127° (degrees) Roof Height: 2 (ft or stories) Parapet Height: _____ (ft)

Tilt of Roof: 9° (degrees)

REQUIRED PHOTOS:

- ☐ Building or house from the ground – show roof where we are installing PV
- ☐ Meter (location) Front Bldg 1
- ☐ Meter (show number) 105 744 228
- ☐ Main electric service (location) Front Bldg 1
- ☐ Main electric service panel (show available space and Amps and voltage)
- ☐ Inverter location we are proposing
- ☐ Roof photos – documents obstructions/shade issues/condition
- ☐ Trees that should be cut down or topped off
- ☐ Trees overhanging the roof
- ☐ Rafter photos for roof where we are installing panels (If you don't have access to rafters, please explain reason)
- ☐ Pictures of conduit path and anywhere holes will be drilled. Asbestos report, NYC only.

REQUIRED MEASUREMENTS:

- ☐ Roof dimensions See Drawings
- ☐ Rafter Size: 2x8 Rafter Spacing: 16 OC Rafter Span: _____
- ☐ Obstructions _____
- ☐ Space constraints for inverter placement _____

BRING WITH YOU: A) Camera, B) Suneye, C) Proposed layout



Project Name

FXEMAX LASIK CENTER PC

Address 200 NEW ROAD

LINWOOD, NJ 08221

Customer Signature

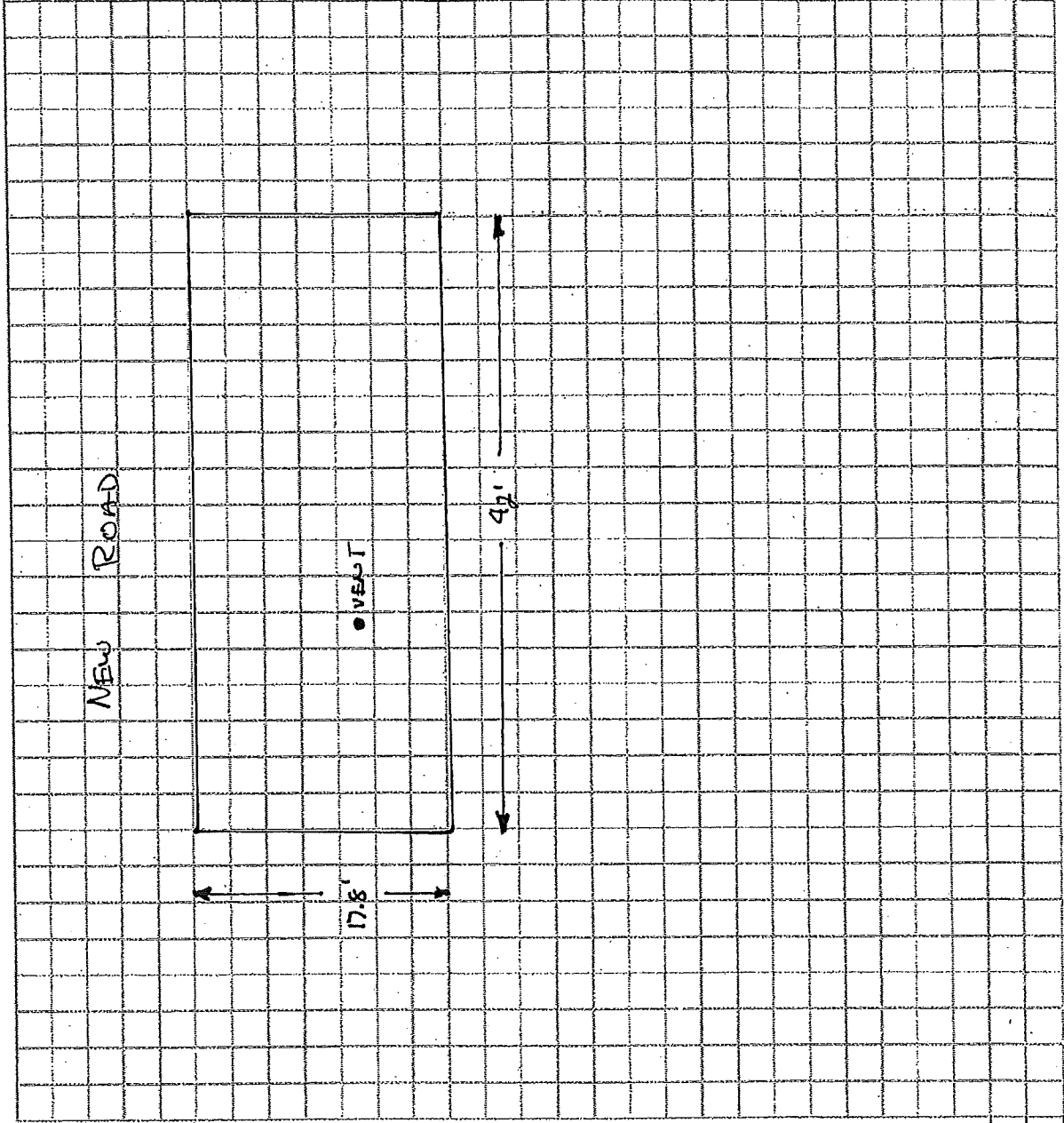
M. J. C.

Customers signature indicates approval of solar layout

Sales Representative

SAULER

System size 8.14
of panels 44
Panel rating 185W
of rows 3
of panels in row 15, 14, 15
of Inverters 1
Inverter Location T80
Pitch 12
Orientation 130
Rafters 2 x 8
on center 16
Main Panel Location T80
Service 150 amps
Distance from inverters to solar array 30'
Distance from inverters to Main panel _____
Vent pipes _____
Vent fans ONE
Shading? NO
Roof condition: Good



[3.4] Installing SolarMount with grounding clips and lugs

Clips and lugs are sold separately.

UGC-1

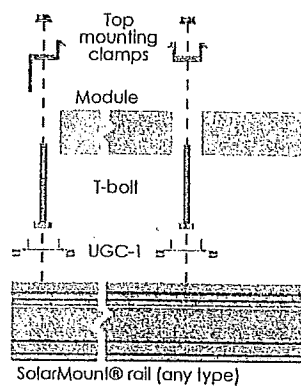
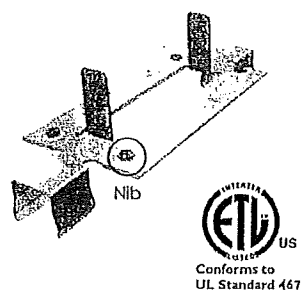


Figure 26. Slide UGC-1 grounding clip into top mounting slot of rail. Torque modules in place on top of clip. Nibs will penetrate rail anodization and create grounding path through rail (see Fig. 3, reverse side).

UGL

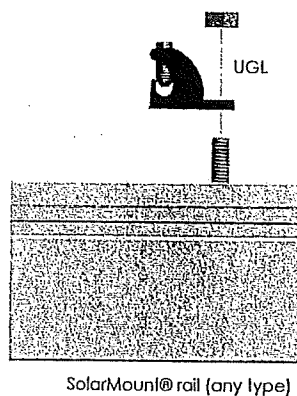
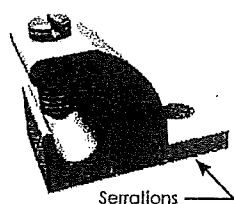
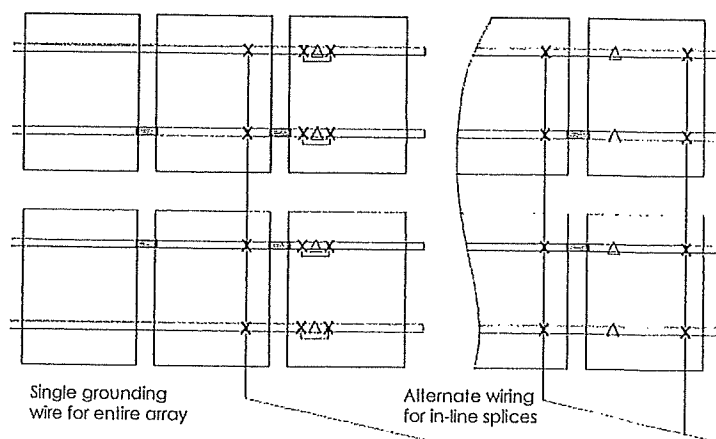
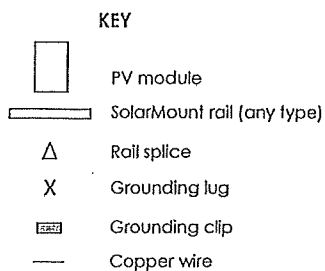


Figure 27. Slide 1/4-inch hex bolt into top mounting slot of any SolarMount® rail (standard, HD, or light). Secure nut with 7/16-inch crescent wrench with sufficient torque for lug serrations to penetrate anodized surface of rail.

Figure 28. Place grounding clips, lugs, and copper wire (6–10 AWG). Place a loop in the wire around splices to prevent tension. Be sure wiring between rails is not taut.



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OR PLUMBER'S
LICENSE

State Of New Jersey
New Jersey Office of the Attorney General
Division of Consumer Affairs

THIS IS TO CERTIFY THAT THE
Division of Consumer Affairs

HAS REGISTERED

Mercury Solar Systems, Inc.
Stephen Ball
36 Midland Avenue
Port Chester NY 10573

FOR PRACTICE IN NEW JERSEY AS A(N): Home Improvement Contractor

New Jersey Office of the Attorney General
Division of Consumer Affairs
THIS IS TO CERTIFY THAT THE
Division of Consumer Affairs
HAS REGISTERED
Mercury Solar Systems, Inc.
Home Improvement Contractor

NOT AN ELECTRICIAN'S OR PLUMBER'S LICENSE
11/18/2010 TO 12/31/2011
VALID
13VH05183500
License/Registration/Certificate #
ACTING DIRECTOR

11/18/2010 TO 12/31/2011
VALID

13VH05183500
LICENSE/REGISTRATION/CERTIFICATION #

Signature of Licensee/Registrant/Certificate Holder

ACTING DIRECTOR

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IF YOUR LICENSE/REGISTRATION/
CERTIFICATE ID CARD IS LOST
PLEASE NOTIFY:

Division of Consumer Affairs
P.O. Box 46016
Newark, NJ 07101

PLEASE DETACH HERE

Mercury Solar Systems, Inc.

EXPIRATION DATE 2011

YOUR LICENSE/REGISTRATION/CERTIFICATE NUMBER IS 13VH 05183500 . PLEASE USE IT IN ALL
CORRESPONDENCE TO THE DIVISION OF CONSUMER AFFAIRS. USE THIS SECTION TO REPORT ADDRESS
CHANGES. YOU ARE REQUIRED TO REPORT ANY ADDRESS CHANGES IMMEDIATELY TO THE ADDRESS NOTED
BELOW.

Division of Consumer Affairs
P.O. Box 46016
Newark, NJ 07101

PRINT YOUR NEW ADDRESS OF RECORD BELOW.
YOUR ADDRESS OF RECORD IS THE ADDRESS THAT WILL PRINT ON
YOUR LICENSE/REGISTRATION/CERTIFICATE AND IT MAY BE MADE
AVAILABLE TO THE PUBLIC.

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BUSINESS ☐

TELEPHONE
INCLUDE AREA CODE

PRINT YOUR NEW MAILING ADDRESS BELOW.
YOUR MAILING ADDRESS IS THE ADDRESS THAT WILL BE USED BY THE
DIVISION OF CONSUMER AFFAIRS TO SEND YOU ALL CORRESPONDENCE.

HOME ☐
BUSINESS ☐

TELEPHONE
INCLUDE AREA CODE

If the law governing your profession requires the current license/registration/certificate to be displayed, it should be
within reasonable proximity of your original license/registration/certificate at your principal office or place of
business.

OFFICE DATE RECEIVED: _____

VIII. PRIOR APPROVALS CHECKLIST (office use only)	LOCAL APPROVAL		COUNTY APPROVAL		REGIONAL APPROVAL		STATE APPROVAL		COMMENTS
	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	
☐ Zoning Officer			X	X	X	X	X	X	
☐ Planning Board			X	X	X	X	X	X	
☐ Zoning Board			X	X	X	X	X	X	
☐ Sewer Authority			X	X	X	X	X	X	
☐ Water Authority			X	X	X	X	X	X	
☐ Police Department			X	X	X	X	X	X	
☐ Health Department			X	X	X	X	X	X	
☐ Soil Conservation			X	X	X	X	X	X	
☐ N.J. Department of Community Affairs	X	X	X	X	X	X	X	X	
☐ N.J. Department of Transportation	X	X	X	X	X	X	X	X	
☐ N.J. Department of Environmental Protection	X	X	X	X	X	X	X	X	
☐ Utility Dig No.			X	X	X	X	X	X	
☐									
☐									

IX. SUBCODES AND SPECIAL REGULATIONS APPLICABLE (office use only—optional)	
Name of Code & Edition	Name of Code & Edition
Building _____	Energy _____
Electrical _____	Barrier Free _____
Plumbing _____	Flood Hazard _____
Fire Protection _____	As Built Elevation Cert. _____
Mechanical _____	Other _____

X. CERTIFICATES ISSUED (office use only)		DATE ISSUED	DATE EXPIRED	DATE REISSUED	DATE EXPIRED
☐ Temporary Certificate of Occupancy	No. _____	_____	_____	_____	_____
☐ Temporary Certificate of Compliance	No. _____	_____	_____	_____	_____
☐ Continued Certificate of Occupancy	No. _____	_____	_____	_____	_____
☐ Certificate of Compliance	No. _____	_____	_____	_____	_____
☐ Certificate of Occupancy	No. _____	_____	_____	_____	_____
☐ Certificate of Approval	No. _____	_____	_____	_____	_____
☐ Lead Abatement Clearance Certificate	No. _____	_____	_____	_____	_____