City of Portland, Maine - Building or Use Permit Application

389 Congress Street, 04101 Tel: (207) 874-8703, Fax: (207) 874-8716

PERMIT ISSUED
JAN - 3 2005
CITY OF PORTLAND

Permit No:	Issue Date:	CBL:
04-1622		271 A002001

Location of Construction:	Owner Name:	Owner Address:	Phone:
550 Warren Ave	Joker's Realty Two Llc	510 Warren Ave	
Business Name:	**Contractor Name:**	**Contractor Address:**	**Phone**
	Destefano and Associates	2456 Lafayette Rd Portsmouth	6037651538
Lessee/Buyer's Name	**Phone:**	**Permit Type:**	**Zone:**
		Additions - Commercial	C-4

Past Use:	Proposed Use:	Permit Fee:	Cost of Work:	CEO District:
Commercial/Portland Sports Ctr	Portland Sports Ctr. 8,000 sq ft addition for Batting Cages "Fi..ben Ropes"	$3,696.00	$400,000.00	5

FIRE DEPT: ☑ Approved ☐ Denied
Signature:

INSPECTION: Use Group: A-4 Type: 3B
12/30/04
Signature:

Proposed Project Description:
Portland Sports Ctr. 8,000 sq ft addition for Batting Cages

original Approval under permit 03-0882

PEDESTRIAN ACTIVITIES DISTRICT (P.A.D.)
Action ☐ Approved ☐ Approved w/Conditions ☐ Denied
Signature: Date:

Permit Taken By:	Date Applied For:
ldobson	10/27/2004

1. This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules.
2. Building permits do not include plumbing, septic or electrical work.
3. Building permits are void if work is not started within six **(6)** months of the date of issuance. False information may invalidate a building permit and stop all work..

Zoning Approval

Special Zone or Reviews	Zoning Appeal	Historic Preservation
☐ Shoreland N/A	☐ Variance	☑ Not in District or Landmark
☐ Wetland	☐ Miscellaneous	☐ Does Not Require Review
☐ Flood Zone Panel 6 Zone X	☐ Conditional Use	☐ Requires Review
☐ Subdivision	☐ Interpretation	☐ Approved
☐ Site Plan original #2003-0046	☐ Approved	☐ Approved w/Conditions
Maj ☒ Minor ☐ MM ☐	☐ Denied	☐ Denied
Date: OK 1/5/05	Date:	Date:

CERTIFICATION

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the application is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provision of the code(s) applicable to such permit.

SIGNATURE OF APPLICANT | ADDRESS | DATE | PHONE

RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE | DATE | PHONE

Form # P 04

DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK

CITY OF PORTLAND

B[illegible]CTION

PERMIT

Please Read Application And Notes, If Any, Attached

PERMIT ISSUED

Permit Number: 041622

JAN - 3 2005

CITY OF PORTLAND

This is to certify that Joker's Realty Two Llc /Dest[illegible]no and A[illegible]

has permission to Portland Sports Ctr. 8,000 sq[illegible]ddition[illegible] Batti[illegible]ages

AT 550 Warren Ave [illegible] 271 A002001

provided that the person or persons, [illegible]m or [illegible]rporation [illegible]epting this permit shall comply with all of the provisions of the Statutes of M[illegible]ne and of th[illegible]n[illegible]es of the City of Portland regulating [illegible]n, maintenance and u[illegible] of buildings and st[illegible]res, and of the application on file in this department.

Apply to Public Works for street line and grade if nature of work requires such information.

N[illegible]ication[illegible] inspec[illegible] must gi[illegible] and wr[illegible]n permis[illegible]n procu[illegible] be[illegible]e this b[illegible]ding or [illegible]t thereo[illegible] la[illegible]d or c[illegible]closed-in. H[illegible]R NOTICE IS REQUIRED.

A certificate of occupancy must be procured by owner before this building or part thereof is occupied.

OTHER REQUIRED APPROVALS

Fire Dept. [illegible]

Health Dept. _____

[illegible]

Other _____
Department Name

12/30/04
Director - Building & Inspection Services

PENALTY FOR REMOVING THIS CARD

City of Portland, Maine - Building or Use Permit

389 Congress Street, 04101 Tel: (207) 874-8703, Fax: (207) 874-8716

Permit No:	Date Applied For:	CBL:
04-1622	10/27/2004	271 A002002

Location of Construction:	Owner Name:	Owner Address:	Phone:
550 Warren Ave	Portland Sports Center Llc	512 Warren Ave	
Business Name:	**Contractor Name:**	**Contractor Address:**	**Phone**
	Destefano and Associates	2456 Lafayette Rd Portsmouth	(603) 765-1638
Lessee/Buyer's Name	**Phone:**	**Permit Type:**	
		Additions - Commercial	

Proposed Use:	Proposed Project Description:
Portland Sports Ctr. 8,000 **sq** ft addition for Batting Cages	Portland Sports Ctr. 8,000 sq ft addition for Batting Cages

Dept: Zoning **Status:** Approved **Reviewer:** Marge Schmuckal **Approval Date:** 11/15/2004
Note: was part of the original approval in 2003 - #03-0882 **Ok to Issue:** ☐

Dept: Building **Status:** Approved **Reviewer:** Mike Nugent **Approval Date:** 12/30/2004
Note: **Ok to Issue:** ☐

Dept: Fire **Status:** Approved with Conditions **Reviewer:** Lt. MacDougal **Approval Date:** 1111512004
Note: **Ok to Issue:** ☐

1) the fire alarm system shall be maintained to NFPA 72 standards
2) the sprinkler system shall be maintained to NFPA 13 standards
3) Application requires State Fire Marshal approval.

Dept: Engineering **Status:** **Reviewer:** Tony **Approval Date:**
Note: Reviewed on April 11, 2003 **Ok to Issue:** ☐

- The stormwater "hydrocad" calculations diagram does not agree with the post-development conditions map. Specifically, the report diagram specifies "pond 2P" flowing in "pond 1P". The plan specifies "pond 1P" flowing into the analysis point, "pond 2P".

- Although the stormwater report reflects a reduction in the post-development peak rates of runoff outletting the site, Public Works is more concerned with the increased volume of runoff leaving the site. The stormwater narrative does not discuss the downstream flooding issues for properties on Holm Avenue, that are currently impacted by the volume of runoff generated on properties along Warren Avenue. This development will result in a peak volume runoff increase of 90%. This will certainly have an impact on the properties along Holm Avenue. As such, Public Works is requesting the applicant either develop a plan to retain additional runoff volume or make an infrastructure financial contribution towards stormwater improvements planned through the Capisic Watershed Master Plan.

Dept: DRC **Status:** Approved with Conditions **Reviewer:** Sebago Technic **Approval Date:** 07/22/2003
Note: **Ok to Issue:** ☑
1) see Planning conditions

Dept: Planning **Status:** Approved with Conditions **Reviewer:** Kandi Talbot **Approval Date:** 07/22/2003
Note: **Ok to Issue:** ☑

Location of Construction:	Owner Name:	Owner Address:	Phone:
550 Warren Ave	Portland Sports Center Llc	5 12 Warren Ave	
Business Name:	**Contractor Name:**	**Contractor Address:**	**Phone**
	Destefano and Associates	2456 Lafayette Rd Portsmouth	(603) 765-1638
Lessee/Buyer's Name	**Phone:**	**Permit Type:**	
		Additions - Commercial	

4) iv. Fixture "E', as shown on the lighting photometric plan, shall not exceed 250 watts.

5) iii. that the applicant contribute $25,000 towards stormwater improvements planned through the Capisic Brook Watershed Master Plan prior to issuance of a building permit.

6) ii. that the plans be revised to include a landscaped island with trees on the easterly side of the rear parking area, that groups of buffering be installed to screen the property from the rear, that the Crimson Barberry specie be changed to a Bayberry specie or a plant which is more natural and less invasive, and that the plan be reviewed and approved by the City Arborist.

7) i. that the applicant contribute $5,000 for construction of sidewalk and granite curb along Warren Avenue, to connect the existing sidewalks between the Joker's property and Home Depot's property prior to issuance of a building permit.

Comments:

11/16/2004-mjn:
1)The Statement of Special Inspetion needs to be more inclusive, please look at Section 1704 of the 2003 IBC. The submission just includes geotchnical elements and foundation work.

2) The "MUROX" plans are not stamped.

3) Changer Nangia's page 3 certificaion form is incomplete. Use Group groups need to be properly identified and the type of construction. (and more)

4) Need stamped HVAC Plans

5) Is the Modular Building staying????????????????? If that's the intent.....Type *2* construction?????????????

6) Interested in Fire separation assemblies between the offices and the "A" use groups.

7) Looking for some recognition of the portential for Snow Drifting conditions and the design work necessary to accomodate this.

All Purpose Building Permit Application

If you or the property owner owes real estate or personal property taxes or user charges on any property within the City, payment arrangements must be made before permits of any kind are accepted.

550 Warren Ave

Location/Address of Construction: 512 Warren Ave		
Total Square Footage of Proposed Structure: 8000 Expansion	Square Footage of Lot: 311,963	
Tax Assessor's Chart, Block & Lot — Chart# 278 Block# B Lot# 7	Owner: Double Play LLC / Mike Coutts	Telephone: 207 878-2600
Lessee/Buyer's Name (If **Applicable**)	Applicant name, address & telephone: 603 430 0339 DeStefano & Associates 2456 Lafayette Rd. Portsmouth, NH 03801	cost Of Work: $ 400,000 Fee: $ 3696

Current **use:** Sports

If the location is currently vacant, what was prior use: _____

Approximately how long has it been vacant: _____

Proposed use: Sports

Project description: Addition of 8000 sf to existing sports facility for batting cages.

Contractor's name, address & telephone: Same as Applicant.

Who should we contact when the permit is ready: John DeStefano 603 765 1638

Mailing address: JDestefano@Destefano-Assoc.com

Cell 251-0820 Andy

We will contact you by phone when the permit is ready. You must come in and pick up the permit and review the requirements before starting any work, with a Plan Reviewer. A stop work order will be issued and a $100.00 fee if any work starts before the permit is picked up. **PHONE:**

IF THE REQUIRED *INFORMATION* IS NOT INCLUDED IN THE *SUBMISSIONS* THE PERMIT WILL *BE AUTOMATICALLY* DENIED AT THE DISCRETION OF THE BUILDING/PLANNING DEPARTMENT, WE MAY REQUIRE ADDITIONAL INFORMATION IN ORDER TO APROVE THIS PERMIT.

I hereby certify that I am the Owner of record of the named property, or that the owner of record authorizes the proposed work and that I have been authorized by the owner to make this application as his/her authorized agent. I agree to conform to all applicable laws of this jurisdiction. In addition, If a permit for work described in this application is issued, I certify that the Code Official's authorized representative shall have the authority to enter all areas covered by this permit at any reasonable hour to enforce the provisions of the codes applicable to this permit.

Signature of applicant: John DeStefano **Date:** 10/12/04

This is NOT a permit, you may not commence ANY work until the permit is issued.

If You are *in a Historic District you* may be subject *to additional* permitting and fees with the Planning Department on the 4th floor of City Hall

DESTEFANO & ASSOCIATES, INC.
2456 Lafayette Road, Suite 3
PORTSMOUTH, NH 03801

(603)430-0339
Fax (603)430-0346

LETTER OF TRANSMITTAL

DATE	JOB NO.
11-30-04	

ATTENTION MIKE NUGENT

RE: FROZEN ROPES
510 WARREN AVE

TO CITY OF PORTLAND
BUILDING DEPT

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO	DESCRIPTION
1	10/25		2003 STRUCTURAL N INFO
			STAMPED 10/26/04 (1 SHEET)
1	11/22		STATEMENT OF SPECIAL INSPECTIONS
			(18 SHTS)

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval
For your use ☐ Approved as noted Submit _____ copies for distribution
☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints
☐ For review and comment ☐ _____
☐ FOR BIDS DUE _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS

PLEASE CALL JOHN DESTEFANO OR MYSELF IF YOU HAVE ANY QUESTIONS.

THANK-YOU,

ANDY VANASSE
251-0820

COPY TO _____

SIGNED _____

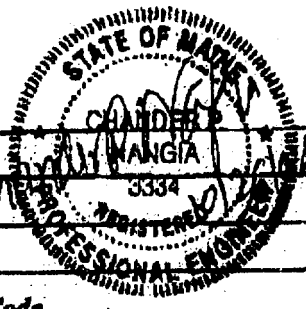
If enclosures are not as noted, kindly notify us at once.

FROM DESIGNER: Chander P. Nangia

DATE: October 25th 2004

Job Name: Frozen Ropes

Address of Construction: Portland, Maine



2003 International Building Code

Construction project was designed according to the building code criteria listed below:

Building Code and Year 2003 Use Group Classification(s) A, E

Type of Construction 2B

Will the structure have a Fire suppression system in Accordance with Section 903.3.1 of t

Is the Structure mixed use? _____ If yes, separated or non separated (see Section 302.3).

Supervisory alarm system? _____ Geotechnical/Soils report required? (See Section 180

STRUCTURAL DESIGN CALCULATIONS

✓ Submitted for all structural members (106.1, 106.1.1)

DESIGN LOADS ON CONSTRUCTION DOCUMENTS (1603)

Uniformly distributed floor live loads (1603.1.1, 1607)

Floor Area Use	Loads Shown

Wind loads (1603.1.4, 1609)

ASCE 7-6 Design option utilized (1609.1.1, 1609.6)

102 Basic wind speed (1609.3)

II, 1.0 Building category and wind importance factor, I_w (Table 1604.5, 1609.5)

C Wind exposure category (1609.4)

±0.18 Internal pressure coefficient (ASCE 7)

25.9 ¢ / 28.3 Component and cladding pressures (1609.1.1, 1609.6.2.2)

25.9 ¢ / 30.7 Main force wind pressures (1609.1.1, 1609.6.2.1)

Earthquake design data (1603.1.5, 1614 - 1625)

IBC 2003 Design option utilized (1614.1)

I Seismic use group ("Category") (Table 1604.5, 1616.2)

0.527 ¢ / 0.230 Spectral response coefficients, S_{DS} & S_{D1} (1615.1)

E Site class (1615.1.5)

— Live loa (160

— Roof liv

Roof snow loads (1603.1.5, 1608)

80 Ground snow load, P_g (1608.2)

56 If P_g > 10 psf, flat-roof snow load, P_f (1608.3)

1.0 If P_g > 10 psf, snow exposure factor, C_e (Table 1608.3.1)

1.0 If P_g > 10 psf, snow load importance factor, I_s (Table 1604.5)

1.0 Roof thermal factor, C_t (Table 1608.3.2)

— Sloped roof snowload, P_s (1608.4)

D Seismic design category (1616.3)

2-D Basic seismic-force-resisting system (Table 1617.6.2)

5 / C_d: 4.5 Response modification coefficient, R, and deflection amplification factor, C_d (Table 1617.6.2)

Equivalent lateral force Analysis Analysis procedure (1616.6, 1617.5)

1617.4 Design base shear (1617.4, 1617.5.1)

Flood loads (1603.1.6, 1612)

_____ Flood hazard area (1612.3)

_____ Elevation of structure

Other loads

_____ Concentrated loads (1607.4)

_____ Partition loads (1607.5)

_____ Impact loads (1607.8)

_____ Misc. loads (Table 1607.8, 1607.6.1, 1607.7, 1607.12, 1607.13, 1610, 1611, 2404)

Statement of Special Inspections

Project: Frozen Ropes E-06098

Location: Portland, Maine

Owner: Frozen Ropes

Owner's Address: 510 Warren Avenue, Portland, ME 04101

Architect of Record: Curtis Walter Steward Architects, Portland, ME 04101

Structural Engineer of Record: Murox **Building System.** St George, Quebec
(Super Structure & **Wall System ONLY)**

This statement of Special Inspections is submitted as a condition for issuance in accordance with **the** Special Inspection requirements of the Building ***Code.*** It **includes** a Schedule **of** Special Inspection Services applicable to this project as **well** as the name of the Special Inspector and the identity of other approved agencies intended to be retained for conducting **these** inspections.

The **Special** Inspector shall keep records of **all** inspections and shall furnish inspection reports to the Building Official. Structural Engineer and Architect of Record. Discovered discrepancies shall be brought to the immediate attention of the Contractor for correction. If such discrepancies are not corrected, the discrepancies shall be brought to the attention **of** the Building Official, Structural Engineer and **the** Architect ***of*** Record. The Special Inspection program does not relieve the contractor of his ***responsibilities.***

Interim reports **shall** be **submitted to** the Building Official, Owner, Structural Engineer and Architect of Record.

A final Reporr of Special Inspections documenting completion of all required Special Inspections and correction of any discrepancies noted in the inspections shall be **submitted** prior **to** issuance of certificate of Use and Occupancy.

Job site **safety** and means and methods of construction are solely the responsibility *of* the contractor.

Interim Report Frequency: Upon Completion

Prepared **by:** Murox Building System

Chander P. Nangia, PE

Chander P Nangia

Signature:

Design Professional Seal

STATE OF MAINE
CHANDER P. NANGIA
3334
REGISTERED
PROFESSIONAL ENGINEER

11-22-2004

Date:

Owner's Authorization:

John P Stefano 11/29/04

Signature Date

Building Official's Acceptance:

Signature **Date**

Frozen Ropes E-06098

Schedule of Special Inspection Services

The following sheets comprise the required schedule of special inspections for this project. The construction divisions which requires special inspections for this project are as follows:

	Soils & foundations		Spray Fire Resistance Material
	Cast-in-place concrete		Wood Construction
	Precast Concrete		Exterior Insulation & Finnish System
	Masonry		Mechanical & Electrical Systems
XX	Structural Steel		Architectural Systems
	Cold-formed steel framing		Special Cases

Inspection Agents	Firm	Address
1. Special Inspector	Chander P. Nangia PE	2030, 127E street, Saint-George Quebec, Canada, G5Y 2W8
2. Inspector	Quality Assurance Labs	80 Pleasant Avenue Portland, Maine 04106
3. Inspector	Canam Steel Corp	1ST Avenue, St George Quebec, Canada
4. Inspector	Inspection Agency	

Seismic Performance Category	D
Basic Wind Speed	102
Wind Exposure Category	C

Frozen Ropes E-6098

Quality Assurance Plan

Quality Assurance for seismic Resistance

Seismic Design Category
Quality Assurance Plan Required *(Y)*

Description of seismic force resisting system and designated seismic systems:

Structural Brace Frame Designed by **Murox** Building **System.**

Quality for Wind Requirements

Basic Wind Speed (3 second gust)
Wind exposure Category
Quality Assurance Plan Required (N)

Description of **wind** force resisting **system and** designated wind resisting components:

Statement of Responsibility

Each contractor responsible for **the** construction or fabrication of **a system** or components designated **above *must*** submit a statement of Responsibility.

Contractors Required to submit Statement of Responsibility:

Steel Contractor & Erector.

Qualifications of Inspectors and Testing Technicians

The qualifications of all personnel performing Special inspection activities are subject to the approval of the Building Official, The credentials of all Inspectors and tasting technicians shall be provided if quested.

It is recommended that the person administering the Special inspections program be a Structural Engineer or a Professional Engineer experienced in the design of buildings.

Key for Minimum Qualifications of inspection Agents:

When the Structural Engineer of Record deems it appropriate that the individual performing a stipulated test or inspection have a specific certification or license as indicated below, such designation shall appear below the *Agent Number* on the Schedule of Special Inspections.

SE	**Structural Engineer** - a licensed SE or PE specializing in the design of building structures. This may be required for the inspection of critical structural elements.
GE	**Geoteclinical Engineer** - a licensed PE specializing in soil mechanics and foundations. This may be required for the inspection of difficult soil conditions or deep foundations.
EIT	**Engineer-In-Training** - a graduate engineer who has passed the Fundamentals of Engineering examination. This may be required for the inspection of elements that require some engineering mining to properly evaluate.
ACI	**American Concrete Institute - Level I Certified Concrete Field Testing Technician.** This certification is appropriate for individuals performing concrete sampling, slump tests, air-content tests, temperature tests, unit weight tests, and casting compression test cylinders.
AWS	**American Welding Society - Certified Welding Inspector (CWI).** This certification is appropriate for individuals performing visual inspection of welds.
ASNT	**American Society of Non-Destructive Testing** - Level II or III. This certification is appropriate for individuals performing ultra-sonic testing of welds.
SMSI	**Structural Masonry Special inspector** - certification by ICBO.
SWSI	**Structural Steel and Welding Special Inspector - certification by ICBO.**
SFSI	**Spray-Applied Fireproofing Special Inspector** - certification by ICBO.
PCSI	**Prestressed Concrete Special Inspector** - certification jointly sponsored by ICBO, BOCA and SBCCI with participation form PCI .and PTI.
RCSI	**Reinforced Concrete Special Inspector** - certification jointly sponsored by ACI. ICBO, BOCA and SBCCI

Frozen Ropes E-06098

Schedule of **Special Inspection Services**

Structural Steel

Item	Agent No	Scope
1. **Fabricator** Certification/ Quality Control Procedures	#3 PE/ Canam	**Review shop fabrication** and **quality control** Procedures.
2. Material Certification	#3 PE/ Canam	**Review** certified **mill** test reports and Identification marks.
3. Open Web Steel Joists	**#2 Quality Assurance Labs**	Inspect installation, field welding and bridging of joists.
4. Bolting	**#2 Quality Assurance Labs**	Inspect installation & tightening of high strength bolts. Verify **proper** tightening sequence.
5. Welding	**#2 Quality** Assurance Labs	Visually review all welds. Verify length and size of fillet welds.
6. Structural Details	**#2 Quality Assurance Labs** and #3 PE/ Canam	Review of erection drawings and identification of **marks.**
7. **Metal deck**	**#2 Quality** Assurance Labs	Inspect steel frame **for** proper support, nspect welding & **side** lap fastening ***of*** metal **roof** deck.
8. Others	**#2 Quality** Assurance Labs	**'nspect** steel frame for compliance with construction documents, including racing & connection details.
9. Anchor Bolts	**2 Quality** Assurance Labs	Inspect size, positioning & embedment of anchor bolts. Inspect concrete placement & consolidation around anchors.

Structural Steel Review:

Items	Agents	Scope	References
Fabricator Certification/quality control procedures	#3 Canam Steel Corp	Review each fabricators quality control procedures and welders certificates.	
Material verification of structural steel	#3 Canam Steel Corp/ #2 Quality Assurance Labs	Inspect 10% of marking to conform to ASTM Standards specified in the construction documents (IA). Review of certified mill test reports. (CSC)	ASTM A6 ASTM A568 IBC 1708.4
Material for of high-strength, nuts and washers.	#2 Quality Assurance Labs	Inspect 15% for identification markings to conform to ASTM Standards & manufacturers certificate of compliance.	AISC ASD Section A3.4
Kigh strength bolting	#2 Quality Assurance Labs	Inspect 10% of bearing type bolted connections & 100 % inspection of slip-critical connections (if applicable)	IBC 1704.3.3
Material verification of weld filler materials	#2 Quality Assurance Labs	Identification markings to conform to AWS specifications. Review manufacturers certificate of compliance.	AISC ASD Sect . 3.6
Welding	#3 Canam Steel #2 Quality Assurance Labs	Check welder certification (IA). Inspect 50% of single pass fillet welds less than 5/16" and 100% of roof deck welds (IA). 50% inspection of single pass fillet welds greater than or equal to 5/16", multi-pass fillet welds, complete and partial penetration groove welds. (IA)	AWS D1.1 AWS D1.3 IBC 1704.3.1
Structural framing, details & assemblies	#3 Canam Steel/ or #2 Quality Assurance Labs	Inspect 20%for size and installation and connection details for conformance with construction documents and shop drawings.	IBC 1704.3.2

IA = Inspection Apncy
CSC = Canam Steel Corp

Special Inspection Requirements

Structural tests and special inspections are required on this project for the following portions of construction:

1. **Soils and** Foundations
2. **Cast in place concrete**
3. **Structural Steel**

Structural tests **and inspections** are to be performed by the registered design professional and / **or** a **qualified** person, competent in the inspection of the particular type of construction. **The registered design professionals and suggestions** for **testing** agencies are listed below.

Inspection Agent	Pirm	Address
Engineer of record for foundation	David Price Engineering,	75 Farms Edge Road , North Yarmouth, ME . 04097
Engineer of record for Structural Steel	Murox Building System	2030, 127E street, Saint-George Quebec, Canada, G5Y 2W8
Architect of Record	Curtis Walter Stewart Architects	434 Cumberland Avenue, Portland ME, 04101
Geotechnical Engineer	R.W. Gillespie	86 Industrial Park Road, ste 4 Saco, ME 04072
Testing & Inspection Agency	Quality Assurance Labs	80 Pleasant Avenue Portland, Maine 04106

Notes:

1. **For minimum qualifications for persons performing special inspections refer** to **specifications page # 4.**
2. **The qualifications of all persons performing special inspections are subject to the review of the professional Engineer of record.**

Certificate of Registration

This is to certify that QUASAR *has registered the Quality Management System of:*

LES ACIERS CANAM,

UNE DIVISION DE LE GROUPE CANAM MANAC INC.

115, Boulevard Canam Nord, Casier postal 130, St-Gédéon (Québec) G0M IT0

to the Quality System Standard:

ISO 9001:2000

Initial Registration: 29 July 1998 **Date of Issue:** 5 October 2004 **Date of Expiry:** 29 July 2007

Scope: Design and manufacturing of structural steel components, open web steel joists and pre-fabricated buildings (MUROX)

Certificate Number: Q3345

QUASAR

CWB GROUP

General Manager
Edward J. Whalen, P.Eng.

STEEL JOIST INSTITUTE

THIS TO ATTEST THAT THE

LES ACIERS CANAM

STEEL JOIST PLANT
AT
SAINT GEDEON, QUEBEC, CANADA

HAS SUCCESSFULLY PASSED THE STEEL JOIST INSTITUTE'S
PLANT CERTIFICATION PROGRAM
AND IS HEREWITH CERTIFIED ON THE FOLLOWING PRODUCTS

*** K-SERIES * LH-SERIES * DLH-SERIES * JOIST GIRDERS ***

AWARDED THIS 29TH DAY OF MARCH 2004

VALID THROUGH MARCH 29, 2006

Robert R. Hackworth

MANAGING DIRECTOR

Appendix A

Certificate of Compliance (Bolts)

NUCOR
FASTENER DIVISION

Post Office Box 6100
Saint Joe, Indiana 46785
Telephone 260/337-1600

LOT NO.
171977C

CUSTOMER NO/NAME
9614 AMCAN THREADED PRODUCTS
TEST REPORT SERIAL# FR221948
TEST REPORT ISSUE DATE 11/13/03
DATE SHIPPED 2/05/04
NAME OF LAB SAMPLER: Chad Cook, LAB TECHNICIAN

NUCOR ORDER # 486148
CUST PART #
CUSTOMER P.O. # L-004400

A325

CERTIFIED MATERIAL TEST REPORT

NUCOR PART NO	QUANTITY	DESCRIPTION
169080	400	[redacted] 3/4-10 X 2 A325 HVY HX

MANUFACTURE DATE 11/11/03 STRUC SCREW PLAIN

CHEMISTRY MATERIAL GRADE -1039M

MATERIAL NUMBER	HEAT NUMBER	CHEMISTRY COMPOSITION (WT% HEAT ANALYSIS) BY MATERIAL SUPPLIER C	MN	P	S	SI
RH028522	RR 139329	.41	.89	.008	.016	.21
	MIN	.38	.60			.15
	MAX	.52		.040	.050	.30

GERDEAU-AMERISTEEL
(formly CO-STEEL)
P. O. BOX 31E528
TAMPA, FL 33631-3E28
AZLA NO: 492.01 EXP: 2004-02-28
FOR CHEMICAL TESTING

MECHANICAL PROPERTIES IN ACCORDANCE WITH ASTM A325-02

SURFACE HARDNESS (R30N)	CORE HARDNESS (RC)	PROOF LOAD 28400 LBS	TENSILE STRENGTH 10 DEG-WEDGE (LBS)	STRESS (PSI)
N/A	30.2	PASS	50047	149841
N/A	30.0	PASS	50029	149787
N/A	31.9	PASS	50733	151895
N/A	30.5			
AVERAGE VALUES FROM TESTS		PRODUCTION LOT SIZE 22000 PCS		
	30.7		50270	150508

—VISUAL INSPECTION IN ACCORDANCE WITH ASTM A325 50 PCS. SAMPLED LOT PASSED
HEAT TREATMENT - AUSTENITIZED, OIL QUENCHED & TEMPERED (MIN 800 DEG F)

—DIMENSIONS PER ASME B18.2.6-1996

CHARACTERISTIC	#SAMPLES TESTED	MINIMUM	MAXIMUM
Width Across Corners	8	1.4000	1.4070
Grip Length	8	1.8400	1.8500
Head Height	8	0.4690	0.4740
Threads	8	PASS	PASS

ALL TESTS ARE IN ACCORDANCE WITH THE LATEST REVISIONS OF THE METHODS PRESCRIBED IN THE APPLICABLE SAE AND ASTM SPECIFICATIONS. THE SAMPLES TESTED CONFORM TO THE SPECIFICATIONS AS DESCRIBED/LISTED ABOVE AND WERE MANUFACTURED FREE OF MERCURY CONTAMINATION.
THE STEEL WAS MELTED AND MANUFACTURED IN THE U.S.A. AND THE PRODUCT WAS MANUFACTURED AND TESTED IN THE U.S.A.
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MECHANICAL FASTENER
CERTIFICATE NO. AZLA 132-01

NUCOR FASTENER
A DIVISION OF NUCOR CORPORATION
Morton Schaffer
MORTON SCHAFFER
QUALITY ASSURANCE SUPERVISOR

NUCOR FASTENER

A Division of Nucor Corporation

Post Office Box 6100 • Saint Joe, Indiana 46785 • Telephone 219/337-1800

CUSTOMER NO/NAME 5614 AMCAN THREADED PRODUCTS
TEST REPORT SERIAL# FB156522 NUCOR ORDER # 344607
TEST REPORT ISSUE DATE 4/06/99 CUST PART #
DATE SHIPPED 8/18/99 CUSTOMER P.O. # 2180
NAME OF LAB SAMPLER: MARK GRABER, LAB TECHNICIAN

A325

CERTIFIED MATERIAL TEST REPORT

NUCOR PART NO	QUANTITY	LOT NO.	DESCRIPTION
108880	5000	[redacted]	3/4-10 X 1 3/4 A325 HVY HX STRUC SCREW PLAIN

MANUFACTURE DATE 4/01/99

—CHEMISTRY MATERIAL GRADE -1039M

MATERIAL NUMBER	HEAT NUMBER		C	MN	P	S	SI
			CHEMISTRY COMPOSITION (WTX HEAT ANALYSIS) BY MATERIAL SUPPLIER				
RM017150	RR 117615		.40	.93	.006	.012	.19
		MIN	.30	.60			.15
		MAX	.52		.040	.050	.30

CO-STEEL RARITAN
RARITAN RIVER STEI
P. O. BOX 17202
NEWARK, NJ 07194
A2LA NO: EXP:
FOR CHEMICAL TESTI

—MECHANICAL PROPERTIES IN ACCORDANCE WITH ASTM A325-97

SURFACE HARDNESS (RSON)	CORE HARDNESS (RC)	PROOF LOAD N/A	TENSILE STRENGTH (LBS)	DEG-WEDGE STRESS (PSI)
N/A	26.7	N/A	N/A	N/A
N/A	26.6	N/A	N/A	N/A
N/A	26.0	N/A	N/A	N/A
N/A	28.4	N/A	N/A	N/A
N/A	25.7	N/A	N/A	N/A
N/A	28.8	N/A	N/A	N/A
N/A	25.4	N/A	N/A	N/A
N/A	27.2	N/A	N/A	N/A
AVERAGE VALUES FROM TESTS		PRODUCTION LOT SIZE	107500 PCS	
26.9		TOO SHORT TO TEST		

—VISUAL INSPECTION IN ACCORDANCE WITH ASTM A325 965 PCS. SAMPLED
HEAT TREATMENT - AUSTENITIZED, OIL QUENCHED & TEMPERED (MIN 800 DEG F)

—DIMENSIONS PER ASME B18.2.6-1996

CHARACTERISTIC	#SAMPLES TESTED	MINIMUM	MAXIMUM
Width Across	8	1.4020	1.4090
Grip Length	8	0.2960	0.3230
Head Height	8	0.4630	0.4680
Threads	8		

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MECHANICAL FASTENER
CERTIFICATE NO. A2LA.100249

NUCOR FASTENER
A DIVISION OF NUCOR CORPORATION

Kevin Johnson
KEVIN JOHNSON
QUALITY ASSURANCE SUPERVISOR

NUCOR FASTENER

A Division of Nucor Corporation

Post Office Box 8100 - Saint Joe, Indiana 46785 - Telephone 219/337-1600

CUSTOMER NO/NAME 5614 AMCAN THREADED PRODUCTS
TEST REPORT SERIAL# PB137818 NUCOR ORDER # 344607
TEST REPORT ISSUE DATE 6/03/99 CUST PART #
DATE SHIPPED 6/18/99 CUSTOMER P.O. # 2150
NAME OF LAB SAMPLER: PHILLIP A. TITLER, LAB TECHNICIAN

A325

----------CERTIFIED MATERIAL TEST REPORT----------

NUCOR PART NO	QUANTITY	LOT NO	DESCRIPTION
108868	4950	[redacted]	7/8-10 X 2 A325 HVY HX STRUC SCREW PLAIN

MANUFACTURE DATE 6/25/99

--CHEMISTRY

MATERIAL GRADE -1039M

MATERIAL NUMBER	HEAT NUMBER	--CHEMISTRY COMPOSITION (HTX HEAT ANALYSIS) BY MATERIAL SUPPLIER C	MN	P	S	SI
RM017339	ER 110556	.42	.95	.006	.012	.17
	MIN	.30	.60			.15
	MAX	.52		.040	.050	.30

CO-STEEL RARITAN
RARITAN RIVER STEEL
P. O. BOX 17202
NEWARK, NJ 07194
A2LA NO: EXP:
FOR CHEMICAL TESTING

--MECHANICAL PROPERTIES IN ACCORDANCE WITH ASTM A325-97

SURFACE HARDNESS (RISW)	CORE HARDNESS (RC)	PROOF LOAD N/A (LBS)	TENSILE STRENGTH (LBS)	DEC-WEDGE STRESS (PSI)
N/A	29.2	N/A	N/A	N/A
N/A	28.4	N/A	N/A	N/A
N/A	30.4	N/A	N/A	N/A
N/A	29.1	N/A	N/A	N/A
N/A	28.6	N/A	N/A	N/A
N/A	27.7	N/A	N/A	N/A
N/A	27.5	N/A	N/A	N/A
N/A	29.4	N/A	N/A	N/A
N/A	30.6	N/A	N/A	N/A
N/A	29.4	N/A	N/A	N/A
N/A	29.6	N/A	N/A	N/A
N/A	28.5	N/A	N/A	N/A
N/A	29.4	N/A	N/A	N/A

AVERAGE VALUES FROM TESTS 29.0 PRODUCTION LOT SIZE 211400 PCS

TOO SHORT TO TEST

--VISUAL INSPECTION IN ACCORDANCE WITH ASTM A325 2015 PCS. SAMPLED LOT PASSED
HEAT TREATMENT - AUSTENITIZED, OIL QUENCHED & TEMPERED (MIN 800 DEG F)

--DIMENSIONS PER ASME B18.2.6-1996

CHARACTERISTIC	SAMPLES TESTED	MINIMUM	MAXIMUM
Width Across	8	1.3980	1.4040
Grip Length	8	0.5280	0.5500
Head Height	8	0.4640	0.4740

ALL TESTS ARE IN ACCORDANCE WITH THE LATEST REVISIONS OF THE METHODS PRESCRIBED IN THE APPLICABLE SAE AND ASTM SPECIFICATIONS. THE SAMPLES TESTED CONFORM TO THE SPECIFICATIONS AS DESCRIBED/LISTED ABOVE AND WERE MANUFACTURED FREE OF MERCURY CONTAMINATION. THE STEEL WAS MELTED AND MANUFACTURED IN THE U.S.A. AND THE PRODUCT WAS MANUFACTURED AND TESTED IN THE U.S.A. WE CERTIFY THAT THIS DATA IS A TRUE REPRESENTATION OF INFORMATION PROVIDED BY THE MATERIAL SUPPLIER AND OUR TESTING LABORATORY. THIS CERTIFIED MATERIAL TEST REPORT RELATES ONLY TO THE ITEMS LISTED ON THIS DOCUMENT AND MAY NOT BE REPRODUCED EXCEPT IN FULL.

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MECHANICAL FASTENER
CERTIFICATE NO. A2LA 100249

NUCOR FASTENER
A DIVISION OF NUCOR CORPORATION

Kevin Johnson

KEVIN JOHNSON
QUALITY ASSURANCE SUPERVISOR

A Division of Ameri Corporation
Post Office Box 6100 • Saint Joe, Indiana 46785 • Telephone 219/337-1600

CUSTOMER NO/NAME 9614 AMCAN THREADED PRODUCTS
MUCOR ORDER # 375051
TEST REPORT SERIAL# PR1852982
CUST.PART #
TEST REPORT ISSUE DATE 5/21/00
DATE SHIPPED 5/17/00
CUSTOMER P.O. # 35046
NAME OF LAB SAMPLER: FRANKLIN A. NEAL, LAB TECHNICIAN

AS25

CERTIFIED MATERIAL TEST REPORT

MUCOR PART NO	QUANTITY	LOT NO.	DESCRIPTION
100870	6825	1202191	5/8-18 X 2 1/4 AS25 HVY HX

MANUFACTURE DATE 3/15/00 STRUC SCREW PLAIN

—CHEMISTRY MATERIAL GRADE -10IFH

MATERIAL NUMBER	HEAT NUMBER		C	MN	P	S	SI
			<<CHEMISTRY COMPOSITION (MTR HEAT ANALYSIS) BY MATERIAL SUPPLIER				
89817467	BR 119494		.40	.92	.005	.007	.22
		MIN	.38	.68			.15
		MAX	.52		.040	.050	.30

CO-STEEL USA DIST., INC.
P. O. BOX 705
GREENUP, KY 41144
AZLA NO: EXP:
FOR CHEMICAL TESTING

—MECHANICAL PROPERTIES IN ACCORDANCE WITH ASTM A325-97

SURFACE HARDNESS (BRIN)	CORE HARDNESS (RC)	PROOF LOAD 28400 LBS	TENSILE STRENGTH 6 DEG-WEDGE (LBS)	STRESS (PSI)
N/A	29.1	PASS	47766	143012
N/A	30.6	PASS	47575	142440
AVERAGE VALUES FROM TESTS		PRODUCTION LOT SIZE	6691 PCS	
	29.9		47671	142726

—VISUAL INSPECTION IN ACCORDANCE WITH ASTM A325 315 PCS. SAMPLED LOT PASSED
HEAT TREATMENT - AUSTENITIZED, OIL QUENCHED & TEMPERED (MIN 800 DEG F)

—DIMENSIONS PER ASME B18.2.6-1996

CHARACTERISTIC	#SAMPLES TESTED	MINIMUM	MAXIMUM
Width Across	8	1.4020	1.4120
Grip Length	8	0.7770	0.8070
Head Height	8	0.4630	0.4740
Threads	8	PASS	PASS

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[illegible] DATA IS A TRUE AND ACCURATE REPRESENTATION OF INFORMATION PROVIDED BY THE MATERIAL SUPPLIER AND [illegible] LABORATORY. THIS CERTIFIED MATERIAL TEST REPORT RELATES ONLY TO THE ITEMS LISTED ON THIS DOCUMENT AND MAY NOT BE REPRODUCED EXCEPT IN FULL.

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MECHANICAL FASTENER
CERTIFICATE NO. AZLA 139-01

TECHNICAL SERVICES MANAGER

NUCOR FASTENER

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Post Office Box 6100 • Saint Joe, Indiana 46785 • Telephone 219/337-1800

CUSTOMER NO/NAME 5614 ANCAN THREADED PRODUCTS
TEST REPORT SERIAL# FB154986 NUCOR ORDER # 344607
TEST REPORT ISSUE DATE 5/17/99 CUST PART #
DATE SHIPPED 5/18/99 CUSTOMER P.O. # 2180
NAME OF LAB SAMPLER: MARK GRABER, LAB TECHNICIAN

A325

CERTIFIED MATERIAL TEST REPORT

NUCOR PART NO	QUANTITY	LOT NO.	DESCRIPTION
169580	4275	[redacted]	1/4-10 X 2 1/2 A325 HVY HX STRUC SCREW PLAIN

MANUFACTURE DATE 5/12/99

CHEMISTRY MATERIAL GRADE -1B19H

MATERIAL NUMBER	HEAT NUMBER	CHEMISTRY COMPOSITION (WT% HEAT ANALYSIS) BY MATERIAL SUPPLIER C	MN	P	S	SI
RM017372	RR 118647	.42	.90	.004	.016	.23
	MIN	.30	.60			.15
	MAX	.52		.040	.050	.30

CO-STEEL RARITAN
RARITAN RIVER STEEL
P. O. BOX 17202
NEWARK, NJ 07194
A2LA NO: EXP:
FOR CHEMICAL TESTING

MECHANICAL PROPERTIES IN ACCORDANCE WITH ASTM A325-97

SURFACE HARDNESS (BSCN)	CORE HARDNESS (RC)	PROOF LOAD 28400 LBS	TENSILE STRENGTH 10 DEG-WEDGE (LBS)	STRESS (PSI)
N/A	29.8	PASS	46583	136476
N/A	31.3	PASS	46969	140626
N/A	31.1	PASS	46818	139276
N/A	29.9	PASS	46788	140076
N/A	30.4	PASS	47005	140716
N/A	30.8	PASS	46359	138799
N/A	29.7	PASS	45475	136151
N/A	28.8	PASS	46822	140486
N/A	30.4	PASS	45276	135557
N/A	30.6	PASS	46334	138726
N/A	30.4	PASS	46323	138692
N/A	28.4	PASS	46460	139102
N/A	29.6	PASS	46632	139632
AVERAGE VALUES FROM TESTS		PRODUCTION LOT SIZE	177000 PCS	
	30.1		46357	138795

VISUAL INSPECTION IN ACCORDANCE WITH ASTM A325 1700 PCS. SAMPLED LOT PASSED
HEAT TREATMENT - AUSTENITIZED, OIL QUENCHED & TEMPERED (MIN 800 DEG F)

DIMENSIONS PER ASME B18.2.6-1996

CHARACTERISTIC	#SAMPLES TESTED	MINIMUM	MAXIMUM
Width Across	8	1.3960	1.4060
Grip Length	8	1.0240	1.0870
Head Height	8	0.4710	0.4760
Threads	8	PASS	PASS

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CERTIFICATE NO. A2LA 100269

NUCOR FASTENER
A DIVISION OF NUCOR CORPORATION

Kevin Johnson

KEVIN JOHNSON
QUALITY ASSURANCE SUPERVISOR

NUCOR FASTENER

A Division of Nucor Corporation

Post Office Box 2080 • Conway, Arkansas 72032

CUSTOMER NO/NAME 5616 AMCAN THREADED PRODUCTS
TEST REPORT SERIAL# CB090168 NUCOR ORDER # 344363
TEST REPORT ISSUE DATE 6/24/99 CUST PART #
DATE SHIPPED 8/18/99 CUSTOMER P.O. # 2180
NAME OF LAB SAMPLER: ROBERT QUINT, LAB TECHNICIAN

A325

CERTIFIED MATERIAL TEST REPORT

NUCOR PART NO	QUANTITY	LOT NO.	DESCRIPTION
168698	3400	51XR2GA	3/4-10 X 2 3/4 A325 HVY HX STRUC SCREW PLAIN

MANUFACTURE DATE 6/22/99

MATERIAL GRADE -1053ML

--CHEMISTRY

MATERIAL NUMBER	HEAT NUMBER	--CHEMISTRY COMPOSITION (WT% HEAT ANALYSIS) BY MATERIAL SUPPLIER C	MN	P	S	SI	
CH0027X1	NU 704203	.37	.78	.009	.024	.24	NUCOR STEEL NEBRASKA
	MIN	.30	.60			.15	AZLA NO: EXP:

--MECHANICAL PROPERTIES IN ACCORDANCE WITH ASTM A325-97

SURFACE HARDNESS (RBW)	CORE HARDNESS (RC)	PROOF LOAD 28400 LBS	TENSILE STRENGTH 10 DEG-WEDGE (LBS)	STRESS (PSI)
N/A	30.4	PASS	49160	147186
N/A	29.4	PASS	46920	140479
N/A	28.8	PASS	49490	148174
AVERAGE VALUES FROM TESTS		PRODUCTION LOT SIZE	10700 PCS	
	29.5		48523	145280

--VISUAL INSPECTION IN ACCORDANCE WITH ASTM A325 316 PCS. SAMPLED LOT PASSED
HEAT TREATMENT - AUSTENITIZED, OIL QUENCHED & TEMPERED (MIN 800 DEG F)

--DIMENSIONS PER ASME B18.2.6-1996

CHARACTERISTIC	#SAMPLES TESTED	MINIMUM	MAXIMUM
Width Across	8	1.4040	1.4080
Grip Length	8	1.2500	1.2800
Head Height	8	0.4750	0.4790
Threads	8	PASS	PASS

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MECHANICAL FASTENER
CERTIFICATE NO. AZLA 100250

NUCOR FASTENER
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NICHOLAS TEPOVICH
QUALITY ASSURANCE SUPERVISOR

AMCAN FASTENER
A Division of Nucor Corporation
Post Office Box 6100 • Saint Joe, Indiana 46785 • Telephone 219/337-1800

CUSTOMER NO/NAME 5614 AMCAN THREADED PRODUCTS
TEST REPORT SERIAL# F8151176
TEST REPORT ISSUE DATE 5/15/00
DATE SHIPPED 5/03/00
NAME OF LAB SAMPLER: NIKKI SHULL, LAB TECHNICIAN
MUCOR ORDER # 371284
CUST.PART #
. CUSTOMER P.O. # 3508

A325

CERTIFIED MATERIAL TEST REPORT

MUCOR PART NO	QUANTITY	LOT NO.	DESCRIPTION
108620	2050	IZ2048A	5/8-18 X 5 1/2 A325 HVY HX
MANUFACTURE DATE 3/13/00			STRUC SCREW PLAIN

CHEMISTRY — MATERIAL GRADE -1039M

MATERIAL NUMBER	HEAT NUMBER	C	MN	P	S	SI
RM017467	RR 119494	.40	.92	.005	.007	.22
	MIN	.30	.60			.15
	MAX	.52		.040	.050	.30

CHEMISTRY COMPOSITION (WT% HEAT ANALYSIS) BY MATERIAL SUPPLIER

CO-STEEL USA DIST., INC.
P. O. BOX 705
GREENUP, KY 41144
A2LA NO: EXP:
FOR CHEMICAL TESTING

MECHANICAL PROPERTIES IN ACCORDANCE WITH ASTM A325-97

SURFACE HARDNESS (RSUR)	CORE HARDNESS (RC)	PROOF LOAD 28400 LBS	TENSILE STRENGTH 10 DEG-WEDGE (LBS)	STRESS (PSI)
N/A	27.9	PASS	48358	144784
N/A	28.7	PASS	48892	146388
N/A	27.8	PASS	49145	147141
AVERAGE VALUES FROM TESTS		PRODUCTION LOT SIZE	10000 PCS	
	28.1		48798	146103

VISUAL INSPECTION IN ACCORDANCE WITH ASTM A325 200 PCS. SAMPLED LOT PASSED
HEAT TREATMENT - AUSTENITIZED, OIL QUENCHED & TEMPERED (MIN 800 DEG F)

DIMENSIONS PER ASME B18.2.6-1996

CHARACTERISTIC	#SAMPLES TESTED	MINIMUM	MAXIMUM
Width Across	8	1.4020	1.4070
Grip Length	8	2.0010	2.0300
Head Height	8	0.4650	0.4680
Threads	8	PASS	PASS

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CERTIFICATE NO. A2LA 139-01

MUCOR FASTENER
A DIVISION OF MUCOR CORPORATION

JAMES C CALAMAS
TECHNICAL SERVICES MANAGER

AMCAN
A Division of Nucor Corporation
Post Office Box 8100 • Saint Joe, Indiana 46785 • Telephone 219/337-1600

CUSTOMER NO/NAME
8614 AMCAN THREADED PRODUCTS
NUCOR ORDER # 570107
TEST REPORT SERIAL# FB181175
CUST PART #
TEST REPORT ISSUE DATE 3/21/00
DATE SHIPPED 3/20/00
CUSTOMER P.O. # 3468
NAME OF LAB SAMPLER: FRANKLIN A. NEAL, LAB TECHNICIAN

CERTIFIED MATERIAL TEST REPORT

NUCOR PART NO	QUANTITY	LOT NO.	DESCRIPTION
168618	8525	122045A	3/4-10 X 3 1/4 A325 HVY HX STRUC SCREW PLAIN

MANUFACTURE DATE 3/10/00

CHEMISTRY MATERIAL GRADE -10XPH

MATERIAL NUMBER	HEAT NUMBER	CHEMISTRY COMPOSITION (MTX HEAT ANALYSIS) BY MATERIAL SUPPLIER C	MN	P	S	SI
RM017051	RR 117209	.41	.91	.008	.008	.20
	MIN	.38	.60			.15
	MAX	.52		.040	.050	.30

CO-STEEL USA DIST., INC.
P. O. BOX 705
GREENUP, KY 41144
AZLA NO: EXP:
FOR CHEMICAL TESTING

MECHANICAL PROPERTIES IN ACCORDANCE WITH ASTM A325-97

SURFACE HARDNESS (R30N)	CORE HARDNESS (RC)	PROOF LOAD 28400 LBS	TENSILE STRENGTH 10 DEG-WEDGE (LBS)	STRESS (PSI)
N/A	27.1	PASS	47402	161922
N/A	27.5	PASS	47445	162061
N/A	27.0	PASS	47449	162063
AVERAGE VALUES FROM TESTS		PRODUCTION LOT SIZE	22000 PCS	
	27.1		47432	162012

VISUAL INSPECTION IN ACCORDANCE WITH ASTM A325 315 PCS. SAMPLED LOT PASSED
HEAT TREATMENT - AUSTENITIZED, OIL QUENCHED & TEMPERED (MIN 800 DEG F)

DIMENSIONS PER ASME B18.2.6-1996

CHARACTERISTIC	#SAMPLES TESTED	MINIMUM	MAXIMUM
Width Across	8	1.4030	1.4110
Grip Length	8	1.7700	1.8200
Head Height	8	0.4610	0.4760
Threads	8	PASS	PASS

ALL TESTS ARE IN ACCORDANCE WITH THE LATEST REVISIONS OF THE METHODS PRESCRIBED IN THE APPLICABLE SAE AND ASTM SPECIFICATIONS. THE SAMPLES TESTED CONFORM TO THE SPECIFICATIONS AS DESCRIBED/LISTED ABOVE AND WERE MANUFACTURED FREE OF MERCURY CONTAMINATION.
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ACCREDITED
MECHANICAL FASTENER
CERTIFICATE NO. AZLA 139-01

NUCOR FASTENER
A DIVISION OF NUCOR CORPORATION

JAMES CALAHAS
TECHNICAL SERVICES MANAGER

CURTIS WALTER STEWART
A r c h i t e c t s

Benedict B. Walter, Vice President

434 Cumberland Avenue
Portland ME 04101-2325

Phone: 207.774.4441
Fax: 207.774.4016
E-mail: BWalter@CWSarch.com

November 19,2004

Mike Nugent
Inspection Services Manager
City of Portland
389 Congress Street
Portland, ME 04101

Re: FROZEN ROPES Addition to the Portland Sports Center/Joker's
510 Warren Avenue, Portland, Maine

Dear Mike,

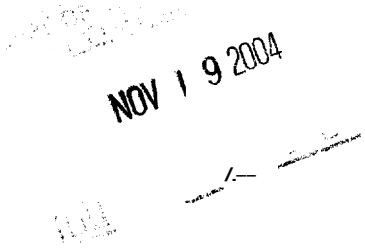
Based on our conversation of 11/18/04, the above referenced addition is designed as an unlimited area Type III B, **A-4** Assembly Use with a full automatic NFPA 13 sprinkler system. Attached is **an** updated Code Review based on IBC 2003 and a revised 2003 IBC Code Review sheet filled in with the architectural components updated by CWS Architects.

It is my understanding that, as a Type III building, interior building elements of any material permitted by the IBC Code are allowed in accordance with 2003 IBC 602.3 Type 111. Specifically, this will be the existing fully-sprinkled modular building serving as the entrance to the Portland Sports Center.

Please feel free to call if you have further questions.

very truly yours,

CURTIS WALTER STEWART ARCHITECTS



Benedict B. Walter, Architect
Vice President

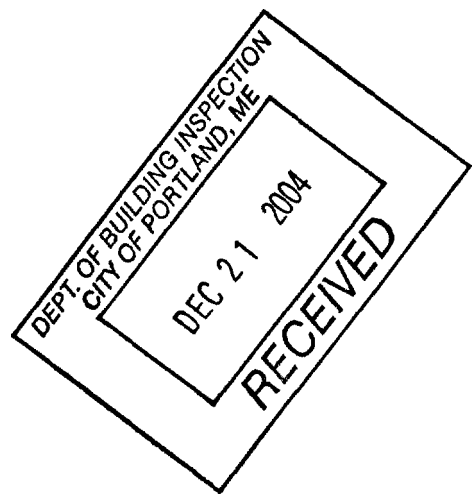
cc: John DeStefano, DeStefano & Associates

attach: CWS Code *Summary* – Frozen Ropes November 19,2004
2003 IBC Code Review Sheet, updated for architectural components

CITY

MECHANICAL PROJECT MANUAL

FROZEN ROPES AT THE JOKERS
PORTLAND, MAINE



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December 20,2004

871 A 2

SECTION 15100- MECHANICAL GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Work Included

1. Furnish labor, materials, equipment, transportation and perform operations required to install heating and ventilating systems in the building, in accordance with these specifications and applicable drawings. Perform demolition and removal as required.

2. Work to be performed includes, but is not limited to the following:

a. Heating and ventilation (H&V) systems
b. Natural Gas fuel supply
c. Duct insulation
d. Fanandlouver
e. Sheet Metal including registers and grilles
f. Temperature control, air testing and balance

3. Specifications and accompanying drawings do not indicate every detail of pipe, valves, fittings, hangers, duct work and equipment necessary for complete installation; but are provided to show general arrangement and extent of work to be performed.

4. Before submitting proposal, Contractor shall be familiar with all conditions. Failure to do so does not relieve Contractor of responsibility regarding satisfactory installation of the system.

B. Mechanical Electrical Work

1. All electric wiring for temperature control system shall be furnished and installed by Portland Air Conditioning lnc.

2. Fan EF-1

Fan shall be wired and provided with disconnect switch with overload protector and shall operate as described in Section 15772.

4. Remote Control Panel

Provide power and interlocking wiring for remote console provided by HV-I unit manufacturer.

5. HV-1

Wire unit through fused disconnect switch as recommended by unit manufacturer. Smoke detector is required for H&V unit.

6. Natural Gas Burner

Furnish circuit breaker for wiring to gas burner control panel by Gas Burner Installer.

1.2 PERMITS

Contractor shall apply for, obtain, and pay for all permits and inspections **required** by law and notify proper authorities in ample time for such inspections to be made.

1.3 MATERIALS

All materials and equipment **shall** be new and of the latest design ***of*** respective manufacturers. All materials and equipment **of** the same classification shall be same manufacturer, unless specified otherwise.

1.4 SHOP DRAWINGS

A. **As** soon as possible after award of Contract, before **any** material **or** equipment is purchased, Contractor shall provide **six *(6)*** copies **of** shop drawings to the engineer for review.

B. Review must be obtained on the **following** items:

1. H&V Equipment

Registers
Volume control dampers (manual and automatic)
Duct sealant
Sheet metal including louver and insulation
Gas pipe and accessones
Heating & ventilating unit and accessories
Fan and accessories
Temperature Controls

1.5 PRODUCT HANDLING

A. Protection

Use all means necessary **to** protect heating and ventilating materials before, during and after installation, and to protect the installed work and materials of all other trades.

1.6 MAINTENANCE MANUAL

A. Upon completion of H&V work provide two copies of a manual describing the system, emergency telephone number and where parts may be obtained.

1.7 GUARANTEE

Contractor shall guarantee all materials and workmanship furnished to be free from all defects for a period of one (1) year from date of final acceptance **of** completed system and shall make good, repair or replace any defective work which may develop within that time.

PART 2 - EXECUTION

2.1 SURFACE CONDITIONS

A. Inspection

1. Prior to all work of this Section, carefully inspect installed work of all other trades and verify that all work is complete to the point where this installation may properly commence.

2. Verify that H&V system may be installed in strict accordance with applicable codes and regulations.

B. Discrepancies

1. In the event of discrepancy, notify Engineer immediately.

2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

2.2 CLEANING

Prior to acceptance of H&V systems, clean casings of H&V equipment of foreign substance.

2.3 INSTRUCTIONS

On completion of project, provide a competent technician to instruct Owner's Representative in the care and operation of systems and equipment. Total period of instruction shall not exceed four (4) hours. The time of instruction shall be arranged with the Owner.

2.5 EQUIPMENT IDENTIFICATION

A. Identify gas piping with Seton mark pipe markers by Seton Name Plate Corporation. Marker shall snap completely around pipe and be visible from all directions. Marker shall include both identification and direction of flow.

END OF SECTION 15100

SECTION 15250 MECHANICAL INSULATION AND CONDENSATE PROTECTION

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

General

Insulate ducts as specified in this Section or indicated on the drawings.

1.2 QUALITY OF COMPLIANCE

A. Fire and Smoke Ratings: For all insulation systems.

Provide composite mechanical insulation (insulation, jackets, coverings, sealers, mastics and adhesives) with flame spread index of 25 or less, smoke developed index of 50 or less, as tested by ASTM E 84 (NFPA 255) method.

Exception: Insulation installed on services located outdoors may have flame spread index of 75 and smoke developed index of 150.

PART 2 - PRODUCTS

2.1 DUCTWORK

Fiber glass duct wrap with factory supplied, non-combustible, vapor barrier facing Thermal conductivity shall not be greater than 0.28 BTU/hour - square feet - F/inch. Duct wrap shall have UL label. All laps to be sealed and held in place with adhesive and flare staples. All lap joints to be folded under before stapling so no raw insulation will be showing. On bottom of ducts 24" or wider, mechanical fasteners shall be provided approximately 12" on centers.

2.2 MISCELLANEOUS MATERIALS

A. Staples, Bands, Wires and Cement: As recommended by insulation manufacturer for applications indicated.

B. Adhesives, Sealers, and Protective Finishes: As recommended by insulation manufacturer for applications indicated.

PART 3 - EXECUTION

3.1 HVAC DUCT SYSTEMS INSULATION

B. Insulate supply duct and duct stub at louver 1-1 with 1-1/2" thick duct wrap:

3.2 INSTALLATION

B. Examine areas and conditions under which mechanical insulation will be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

C. Install insulation products in accordance with manufacturer's written instructions, and in accordance with recognized industry practices to ensure that insulation serves its intended purpose.

D. Install insulation on mechanical systems subsequent to testing and acceptance of tests.

E. Install insulation materials with smooth and even surfaces. Do not use pieces or scraps abutting each other.

F. Clean and dry mechanical surfaces prior to insulating. Butt insulation joints firmly together to ensure complete and tight fit over surfaces to be covered.

G. Maintain integrity of vapor-barrier jackets on mechanical insulation, and protect to prevent puncture or other damage.

G. Extend mechanical insulation without interruption through walls, floors, and similar piping penetrations, except where otherwise indicated.

END OF SECTION 15250

SECTION 15488 - NATURAL GAS

PART 1 - GENERAL

1.1 Provide piping materials and factory fabricated piping products of sues, types, pressure ratings, and capacities needed to install a new gas service to rooftop unit HV-I. Provide materials and products complying with NFPA 54 where applicable. Base pressure rating on natural gas system maximum design pressures. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in natural gas systems. Where more than one type of materials or products are indicated selection is Installer's option.

1.2 QUALITY COMPLIANCE

ANSI Compliance: Comply with applicable provisions of ANSI B31.2.

NFPA Compliance: Comply with applicable provisions of NFPA 54, 1999 Edition

Utility Compliance: Comply with requirements of Northern Utilities, Inc.

State of Maine Compliance: Propane and Natural Gas Board Laws and Rules, 1998 Edition.

PART 2 - PRODUCTS

2.1 GAS SERVICE PIPING

A. All Pipe Sizes: Black steel pipe; Schedule 40; wrought-steel butt welding fittings.

B. Wrapping: Machine wrap pipe using 50% overlap wrap, with polyvinyl chloride tape. Hand wrap fittings using 100% overlap wrap extending 6" beyond fitting onto wrapped pipe.

2.2 BUILDING DISTRIBUTION PIPING

A. Pipe Size 2" and Smaller: Black steel pipe; Schedule 40; malleable-iron threaded fittings.

B. Pipe Size 2-1/2" and Larger: Black steel pipe; Schedule 40; wrought-steel butt welding fittings.

2.01 PIPING SPECIALTIES

A. Escutcheon Plates: Install on each pipe penetration exposed to view in occupied spaces.

B. Sheet-Metal Pipe Sleeves: Install on each pipe penetration through interior partitions and ceilings.

C. Cast-Iron Pipe Sleeves: Install on each pipe penetration through exterior walls or footings, both above and below grade.

D. Steel Pipe Sleeves: Install on each pipe penetration except as otherwise indicated.

E. Sleeve Seals: Install in sleeves in foundation walls below grade and in exterior walls; either caulked lead and oakum or modular mechanical rubber link seals.

2.4 SUPPORTS AND **ANCHORS**

A. General: Provide factory fabricated supports and anchors complying with **MSS** SP-69. Install, complying with **MSS SP-89.**

B. Gas Cocks:

1. Gas service valves 2-1/2" and larger shall **be** lubricated plug type with iron bodies, lubricated iron plug, flanged ends and wrench operated and rated for 175# WOG. (Provide one (1) valve wrench **for** each size valve and turn over wrenches to Owner's Representative)
2. Gas service valves **2**" and smaller shall be butterfly **type** with bronze body, stainless steel stem and disc with Viton seal, **AGA** approved and UL Listed. Supply with "**T**" or lever handle as approved by local **gas** supplier.

C. Install at connection to gas train for each gas-fired equipment item; on branches and **risers** as indicated.

PART **3** - EXECUTION

3.1 GENERAL

A. No person other than an authorized employee of Northern Utilities, Inc., shall repair, alter, or make connections to a gas pipe upstream of the meter or restore gas service to the premises.

B. Gas meters **should** be **installed** within five feet (5') of the service entrance to a building and at least **three** feet (3') distance from any electrical, switching gear, transformers or outlets.

C. The Installer is responsible for his own work, including proper sizing, proper materials, supports and testing.

D. Submit Certificate/Form to Northern Utilities, Inc. to activate gas ***service.***

3.2 GAS SERVICE

A. General: Arrange with Northern Utilities, Inc., to provide gas service to indicated location **with** shutoff at terminus. Consult with Utility as to extent of it's work, costs, fees and permits involved. Pay such costs and fees; obtain permits.

B. Extend service pipe from Northern Utilities, Inc., terminus to ***roof*** building wall under Utilities' direction.

C. Mechanical Contractor shall provide shutoff outside building downstream of gas meter. Gas service valve box **with** cover on upstream side of meter shall be by Northern Utilities.

3.3 EQUIPMENT CONNECTIONS

A. General: Connect gas piping to rooftop unit HV-1 with drip leg and shutoff gas cock. Comply **with** equipment manufacturer's instructions.

B. Provide shutoff in gas service **pipe** at entry to building. Extend pipe to gas meter location indicated. Provide parts and accessories required by Utility to **connect** meter.

3.4 PIPING TESTS

A. Test natural gas piping in accordance with NFPA 54 and Northern Utilities, Inc.

3.5 PIPING INSTALLATION

1. Install natural gas piping in accordance with applicable codes and Northern Utilities, Inc., requirements.
2. Use sealants on metal gas piping threads which are chemically resistant to natural gas. Use sealants sparingly, and apply to only male threads of metal joints. Pipe joint compound shall be used on all threaded joints.
3. Remove cutting and threading burrs before assembling piping.
4. Do not install defective piping or fittings. Do not use pipe with threads which are chipped, stripped or damaged.
5. Plug each gas outlet, including valves with threaded plug or cap immediately after installation and retain until continuing piping or equipment connections are completed.
6. Ground gas piping electrically and continuously within project, and bond tightly to grounding connection.
7. Install drip-legs in gas piping at each riser at point where it is joined to horizontal run of pipe and where required by code or regulation.
8. Install "Tee" fitting with bottom outlet plugged or capped at bottom of pipe risers.
9. Use dielectric unions where dissimilar metals are joined together.
10. Install piping with 1/64" per foot (1/8%) downward slope in direction of flow.
11. Install piping parallel to other piping, but maintain minimum of 12" clearance between gas piping and steam or hot water piping above 180°F. (93°C); between any gas piping and any other hot surface such as breaching.
12. No supply run to be smaller than 3/4" ID.
13. All material to be new and unused when piping is to be concealed.
14. Metallic pipe and fitting threads shall be taper threads and shall comply with the standard for pipe threads. General purpose (inch) ANSI/ASME B 1.20.1.
15. When installing gas piping which is to be concealed, the following shall not be used: Unions, tubing, fittings, threads, right and left couplings, bushings and swing joints made by combinations of fittings. Only elbows, tees and screw couplings are approved for use in concealed piping.
16. Piping passing through concrete, brick, concrete block, walls or floor is to be sleeved or protected from corrosion.
17. Piping in floors is to be protected from corrosion.
18. Piping underground, beneath buildings is prohibited.
19. Piping is not to be embedded in concrete floor.
20. Drop pieces are to be run full size to the appliance. Any reduction in the pipe size is to be done as close to the appliance as possible.
21. Prohibited Locations: Gas piping inside a building shall not be run in or through a circulating air duct, clothes chute, chimney or gas vent, ventilating duct, dumb waiter, elevator shafts or underneath buildings.
22. When any other fuel gas is to be interconnected with the natural gas system, Northern Utilities, Inc., should be contacted to advise the proper method.
23. Prohibited Concealed Piping:

    a. Concealed gas piping shall not be located in solid partitions (concrete or cinder block). Tubing shall not be run in hollow walls or partitions unless protected against physical damage.
    b. Concealed gas piping shall not he run horizontally through hollow walls or partitions.
    c. Valves, cocks or any shutoff devices shall not he installed in concealed gas piping.

3.6 APPLIANCE INSTALLATION

A. All appliances will be installed in accordance with manufacturer's recommendations. The recommendations will appear on name plate or on separate instructions which accompany the appliance. This information will list *minimum* clearance to combustible material and other information required for proper installation.

B. A separate shutoff will be installed in an accessible location at each appliance.

3.7 TESTING

A. Every new or enlarged *system* of gas piping must be tested and the proper completed form submitted to Northern Utilities, Inc. before gas will be turned on.

B. Testing for Tightness: **(NFPA 54,** Page 33 - 4.1.2 (A.) OXYGEN SHALL NOT BE USED AS A TESTING **MEDIUM.** Note: **A** proper test cannot be made with appliances connected. This could also result in expensive damage *to* the controls on the appliance. Gas meter must also be isolated from section being tested, as pressure back against meter will cause extensive internal damage.

C. Test Pressure: Minimum test pressure for low pressure delivery in concealed gas piping systems (below 1/4 psi) shall be no less than 25 psig for a time period of one hour. Minimum test pressure for high pressure delivery systems (above 1/4 psi) shall be no less than 65 psig for one hour for piping under 2". 100 psi for piping above 2" or where pipe is welded. During pressure test, all joints shall be tested with a soap and water solution. **Any** leaks found will be *repaired* and system again tested.

D. After successful pressure test, piping shall be connected to meter and the appliance connected to piping **system.**

E. All outlets including *those* with shutoff valve, shall be closed gas-tight with plug or cap if threaded. **Any** pipe left temporarily shall be plugged or capped gas-tight. If flanged, a blind flange and proper gasket shall be installed.

3.8 NOTICE

Northern Utilities, Inc., responsibility for gas piping in any installation is limited to pipe and fittings which comprise service entering installation up to and including outlet connections of the meter or meter bar. All meters shall be installed within five feet of service entrance. Where special requirements prohibit installation of meters within five feet (5') of service entrance, Northern Utilities, Inc., shall be contacted to obtain authorization to proceed with an alternate meter piping configuration under requirements specified by the Company.

END OF SECTION 15488

SECTION 15772- HEATING AND VENTILATING EQUIPMENT

PART 1 - GENERAL

1.1 SCOPE

Provide rooftop heating and ventilating unit, exhaust fan, louver and temperature controls.

PART 2 - PRODUCTS

2.1 HV-1 ROOFTOP UNIT

Power vented, natural gas fired forced air furnace designed for outdoor installation. Unit shall spark ignited intermittent pilot, two stage 24 volt gas valve, limit and safety controls, venter pressure switch to verify power vent flow before allowing operation of the gas valve. Unit shall have weatherized galvalume steel cabinet with interlocking joint construction. Provide plenum for downturn of air flow. Unit shall have aluminized steel heat exchanger, 24 volt control transformer, motor contactor, terminal block, filter rack with 2" throwaway filters, full curb cap base and adjustable belt drive. Provide 30% outside air inlet with hood and manual outside air dampers. Provide thermostat with two stage control (100% and 50%) and remote console with lights indicating blower is operating. Unit shall be Reznor Model RPB 250.

2.2 EXHAUST FANS

American Coolair Type CBHX AMCA Certified propeller exhaust fans as manufactured by American Coolair Corporation. Provide welded steel panel and structural angle supports, die formed steel blades firmly attached to aluminum hub, oversized sealed ball bearings, belt drive motor, automatic (gravity) shutter and metal housing with mounting flanges and motor side guard.

2.3 LOUVER L-1

NCA Manufacturing, Inc. Model WDR-6 Wind Driven Rain Resistant sightproof extruded Stationary Louver. Louver shall be AMCA Licensed for Wind Driven Rain at 29.1 MPH. Frames shall be 0.081 inches thick and blades 0.090 inches thick extruded aluminum alloy. Provide screen removable for cleaning. Pprovide motor operated damper with Siemens OpenAir CGD Electronic Damper Operator.

2.4 AUTOMATIC TEMPERATURE CONTROL

A. Overview:

During cold weather, space heating and occupant ventilation shall be provided by heating & ventilating unit HV-1 with exhaust fan EF-I OFF and outside air louver L-1 damper closed. EF-1 and intake damper ventilation system does not have any heating capability and should not be used during cold weather.

During warmer weather, HV-1 shall be OFF and EF-1 shall be ON with outside air louver L-1 damper OPEN Operation of EF-1 and interlocked damper operator shall be at the option of the Owner.

B. Heating and Ventilating Unit HV-1:

OCCUPIED:

Two stage thermostat shall monitor space temperature against set point (70F adjustable) and cycle HV 1 rooftop gas burner staged at 100%, 50% or OFF to meet thermostat setpoint. During Occupied periods, 30% outside air damper small open and fan shall run continuously.

UNOCCUPIED:

Thermostat set point shall be reset to 55F (adjustable) and HV-1 shall cycle fan intermittently on call for heat and turn gas burner ON to maintain room temperature. In addition, 30% outside air damper shall be closed.

A remote console shall indicate when gas burner is operating or OFF

C. Exhaust Fan EF-1

1. EF-1: Batting area exhaust fan shall be controlled from a wall mounted manual switch. When manual switch is toggled ON, motor operated damper at intake and gravity shutter at exhaust fan shall move to open position and fan shall start upon proof intake motor operated damper is open. Toggling, manual switch OFF, fan motor shall stop and both dampers shall close.

PART 3 - EXECUTION

3.1 INSTALLATION

A. *General:* Install split system indoor and outdoor units in accordance with manufacturer's installation instructions. Install unit plumb and level, firmly anchored in location indicated, and maintain manufacturer's recommended clearances.

B. Support: Install outdoor unit on reinforced concrete pads and suspend indoor unit from steel angles, rods and isolators.

C. Electrical Wiring: Install electrical devices furnished by manufacturer, but not specified to be factory-mounted. Furnish copy of manufacturer's wiring diagram submittal to Electrical Installer. Do not proceed with equipment start-up until wiring installation is acceptable to Equipment Installer.

D. Ductwork: Refer to Section 15841, "Low Pressure Ductwork and Accessories". Connect supply and return ducts to unit with flexible duct connections. Provide transitions to exactly match unit duct connection sizes.

E. Start-up HVAC equipment in accordance with manufacturer's start-up instructions. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.

END OF SECTION 15772

SECTION 15841 LOW PRESSURE DUCTWORK AND ACCESSORIES

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Extent of low pressure ductwork is indicated on drawing and in schedules. Low pressure ductwork is defined as ductwork subjected to velocities of 2500 fpm or less, and operating pressure of 2" WG. or less, positive or negative.

B. Types of low pressure ductwork required for project include the following:

Heating supply and return air systems
Exhaust systems
Test and *Air* balancing

1.2 QUALITY COMPLIANCE

A. SMACNA Standards: Comply with SMACNA "HVAC DUCT Construction Standards Metal and Flexible"; 1st Edition 1993.

B. ASHRAE Standards: Comply with ASHRAE Handbook and Product Directory, 2001 Equipment Volume, Chapter 1 "Duct Construction", for fabrication and installation of low pressure ductwork.

C. NFPA Compliance: Comply with the following as applicable:

1. Standard HVAC supply, return, relief, transfer and exhaust ducts not itemized below: NFPA 90A "Standard for the Installation of *Air* Conditioning and Ventilating System", 2002 Edition.
2. Dust, Stock and Vapor Exhaust: NFPA 91-2004 "Standard for the Installation of Blower and Exhaust Systems for Dust, Stock and Vapor Removal or Conveying".

D. Dimensions

The size of ducts marked on the drawings will be adhered to as closely as possible. The right is reserved to vary duct sizes to accommodate structural conditions during progress of work with-out additional cost to Owners. Duct layout is schematic to indicate size and general arrangement only. All ducts shall be arranged to adjust to "field conditions". Sheet Metal Contractor shall coordinate work with Electrical Contractor and other trades.

PART 2 - PRODUCTS

2.1 DUCTS AND AIR TERMINAL DEVICES:

A. Ducts shall be constructed of galvanized steel in accordance with the following table of duct sizes and latest ASHRAE Guide and Data Book unless otherwise shown on drawings.

Dimensions of Longest Side (inches)

Standard Ducts	Sheet Metal Gauge
UP thru 12	26
13-39	24
31-54	22

B. Dampers and Splitters

All dampers and deflectors shall be a minimum of #22 gauge and stiffened as required. Splitter dampers shall not be used.

C. Flexible Connectors

Furnish and install flexible connections on HV-1 unit. Connections shall be made from Ventglas neoprene coated glass fabric as manufacturered by Ventfabrics, Inc.

D. Diffusers, Registers and Grilles

1. Registers shall be installed at *air* supply and return openings as shown. Units shall be provided with white finish and countersunk screw holes. Devices shall be Titus.

2. Supply *Air* Registers: Steel, double deflection AeroBlade Model 272RL with front blades parallel to longest dimension, ¾" blade spacing, individually adjustable blades, steel border with extruded aluminum blades, opposed blade damper and for surface mounting

3. Return *Air* Registers: Steel Model 350RL, ¾" blade spacing, 0 degrees deflection ,opposed blade dampers and for surface mounting.

E. Duct Sleeve

Provide aluminum duct sleeve through outside wall at intake louver and exhaust fan

F. Sealant

Seal ducts with water based, non-combustible sealant equal to multipurpose sealant by Transcontinental Limited.

G. Duct Lining

No duct liner is required

PART 3 - EXECUTION

3.1 GENERAL

Assemble and install ductwork in accordance with recognized industry practices to achieve air tight (5% leakage) and noiseless (no objectionable noise) systems, and capable of performing each indicated service. Install each run with minimum of joints. Align ductwork accurately at connections, within 1/8" misalignment tolerance and with internal surfaces smooth. Support ducts rigidly with suitable ties, braces, hangers and anchors of type which will hold ducts true-to-shape and to prevent buckling.

3.2 SEALING DUCT

A. After installation to seal class recommended in SMACNA "HVAC Duct Standards - 1st Edition 1985". Use sealant described in Paragraph 2.1 (F) of this section. All joints in sheet metal ducts shall be made airtight, and all branches and turns shall be made with long radius elbows and fittings. If long radius elbows are not used, elbows shall be provided with fixed double wall turning vanes designed to reduce resistance of the elbow to equivalent of a long radius elbow with throat radius not less than duct width.